SEPTEMBER 1953

ARMY INFORMATION DIGEST

In This Issue:

KITTY HAWK LEGACY. The granite pylon on the front cover marks a spot on the North Carolina dunes where, fifty years ago, man's age-old dream of flight was shaped into reality by two young mechanics from Dayton, Ohio. The astonishing growth of that dream is manifest on the back cover. Today's B-36 bomber has a 230-foot wingspan, nearly twice the distance covered by man's first powered flight. The Wright brothers' aircraft flew 120 feet in 12 seconds at an average altitude of 10 feet. In contrast, the B-36 can fly 10,000 miles non-stop for 40 hours or more at altitudes of 40,000 feet—and this performance is being exceeded by newer types under development.

BIRTHDAYS WITHIN ANNIVERSARIES. With the airplane approaching its fiftieth birthday in December, all of 1953 is being observed as the "Fiftieth Anniversary of Powered Flight." The establishment of an Aeronautical Division in the Office of the Chief Signal Officer forty-six years ago marked the beginning of military aviation as such. And six years ago this month, the National Security Act of 1947 established the Department of the Air Force in co-equal status with the Army and Navy.

MILITARY AVIATION—past, present and future—is the theme of three related articles. In "Military Aviation—A Force for Peace," the Air Force Chief of Staff surveys the potentialities of today's air power and concludes that "Applied with humane motives and intelligence, the product of Kitty Hawk can well bring forth a new Golden Age."

THE REVOLUTION wrought by air power in strategy and tactics is viewed in perspective in "The First Fifty Years." Forward steps in research and development necessary to insure our Nation's air superiority and safety are described by the Air Force Deputy Chief of Staff for Operations in "Military Aviation—Research for the Future."

KOREAN KALEIDOSCOPE. Headlines from recent history provide the text for "Korean Milestones—1950-53." Besides mirroring the changing fortunes of war on the Korean peninsula, the article cites the significant Army "firsts" accomplished there.

MORE CLIPPINGS carried as prized possessions in soldiers' wallets is the goal of the Army Home Town News Center, as reported in "From Front Lines to Headlines." Commanders have found that mention in one's home town newspaper is a source of continuing pride that sparks troop morale.

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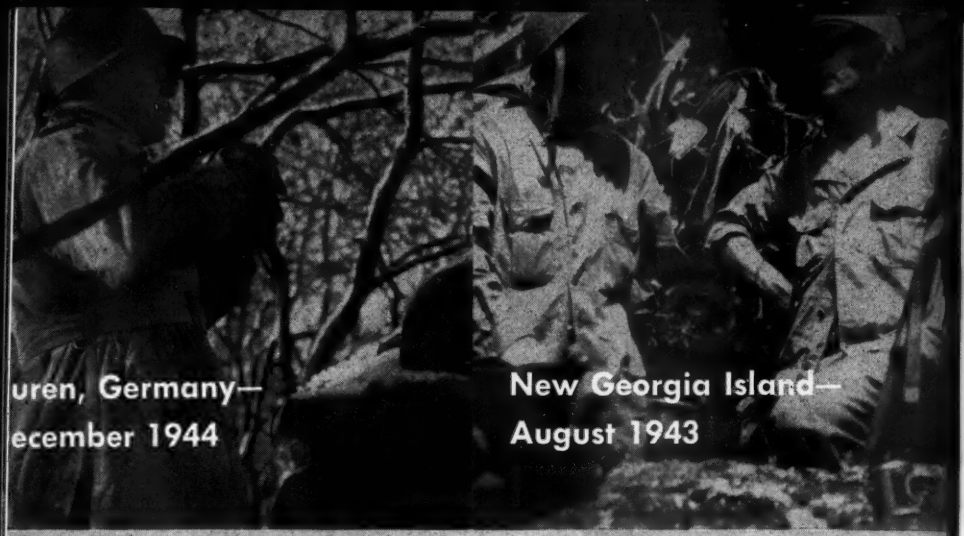

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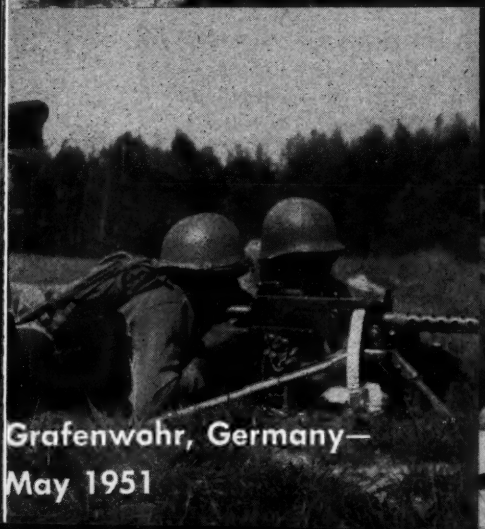

Grafenwohr, Germany—
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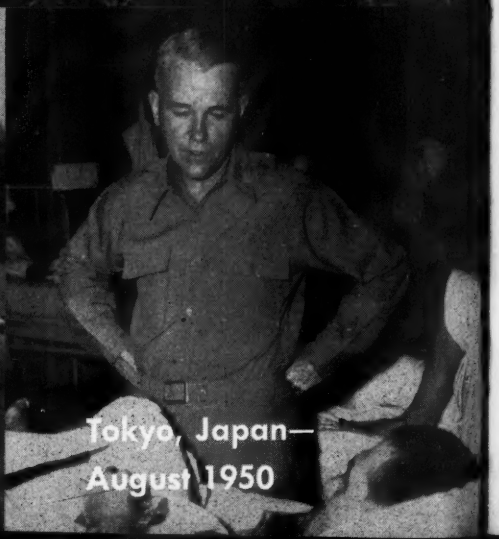


Tokyo, Japan—
August 1950

A SOLDIER'S SOLDIER

THE LAST THREE YEARS have been unparalleled in our military history. We have been virtually fighting a war in peacetime. Large Army forces have been locked in combat with a ruthless enemy on the other side of the world, while we have been mobilizing and demobilizing at the same time.

During this unique period, the Army has had a soldier of unique talents to lead it, its eighteenth Chief of Staff, General J. Lawton Collins.

Known as "Lightning Joe" because of his rare combination of courage, speed and determination, the outgoing Chief's qualities have made him feared by the enemy but admired by military men everywhere. General Collins is loved and respected by all who know him because he also has the human qualities that form a part of all great military leaders. He feels that the foundation of discipline must be the same as the very foundation of our system of government—the preservation of the dignity of the individual.

In combat in both the Pacific and European theaters, he was always up front to determine conditions for himself. When he became Chief of Staff, he resolved to spend as much time as possible in the field, and he made a point of visiting every active division both at home and overseas. He has made eight trips to Korea to see first-hand how his men were faring.

No detail is too small to receive his personal attention. When General Collins inspected troops in Iceland last year, he found a mortar unit which had three new style mortars and one old model. Within a week after he returned to the States, a new model mortar was delivered to round out their equipment.

During his last visit in Germany, he bypassed the command posts and inspected the troops in the field. During a heavy rainstorm, General Collins was found under a tree in a barnyard, testing a French lieutenant's knowledge of his artillery battery's situation—in French.

Concern for the welfare of his men caused General Collins to strive constantly to apply American ingenuity and technology to increase the fire power of the front-line soldier. "Fire power to save manpower" has been his watchword. He pressed for the development of atomic weapons which could be used by Army

forces on the battlefield, and is generally regarded as the father of the 280-mm artillery piece.

Through his emphasis on armor and air mobility, our Army has been made more mobile. It has developed a family of splendid new tanks, of helicopters and other light aircraft, and new techniques for airborne operations. Together these have made our infantry, armor and airborne units the fastest moving, hardest hitting in the world.

Along with the modernization of Army equipment, he has also stressed the necessity for complete teamwork among the services. He has always been a supporter of strong air power and strong naval forces.

Coupled with General Collins' concern for the individual soldier is his deep conviction that there is nothing more important to the American people than to guard their homes from enemy air attack. Because of his emphasis, great progress has been made in the development of guided missiles and other new antiaircraft weapons which show promise of making our air defenses much tighter than was previously thought possible.

His selection to be the Nation's senior military representative to the North Atlantic Treaty Organization is a natural and logical choice, for General Collins has proven that he knows Europe and knows how it can be defended. He has shown also that he is a statesman and diplomat as well as a military leader, and that he has the capacity to weld diverse elements into an individual fighting team.

Our allies have tremendous regard and respect for the retiring Chief of Staff. This is the way the eminent historian Chester Wilmot expressed it: "There was no hesitancy or humbug about Joe Collins . . . Thorough in planning and flexible in direction, he was most adept at subtlety and surprise, quick to change his plan and seize a new opportunity, always ready to adapt his policy to special needs of the . . . occasion."

But equally important are a mother's words in a letter to General Collins: "My only child is still in the Army and loves it. Yet he stormed the Normandy beaches with the 29th Division at the age of nineteen. I have nothing to ask of our leaders, just thanks and gratitude for the work you are doing. . . ."

MILITARY AVIATION--
A FORCE FOR PEACE

GENERAL NATHAN F. TWINING

FIFTY YEARS AGO two bicycle repairmen, Orville and Wilbur Wright, flew a home-made airplane at Kill Devil Hill, four miles south of Kitty Hawk, North Carolina. They made four flights on that cold 17 December in 1903. The first went 120 feet and lasted 12 seconds. The fourth one went 852 feet and lasted 59 seconds.

A few months ago an Air Force B-47 Stratojet bomber, making use of in-flight refueling, flew non-stop more than 12,000 miles in 24 hours.

The contrast between these performances suggests, in some measure, the speed at which aviation has progressed in this half century of powered flight.

Certainly, the airplane has changed the world. Far off places no longer exist, for the airplane has turned the globe into one vast neighborhood. Neither land mass nor ocean represents any formidable barrier to powered flight. In truth, men of science, men of industry and men in the cockpit have combined to thrust upon our civilization the "Air Age."

The United States Air Force, which observes its sixth birthday anniversary this month, has played an important role in this progress. For, although the Air Force did not achieve co-equal status with the Army and Navy until 18 September 1947, its history and traditions date back forty-six years. Military aviation was born 1 August 1907 when the Army created an Aeronautical Division in the Office of the Chief Signal Officer "to study the flying machine and the possibility of adapting it to military purposes."

This country, which gave powered flight to the world, was also the pioneer in military aviation. In 1909 the Wright Brothers successfully demonstrated their *Military Flyer* at Fort Myer, Virginia. The airplane carried two men in continuous flight for more than one hour and, in its final test,

GENERAL NATHAN F. TWINING, USAF, is Chief of Staff, United States Air Force.

made a 10-mile cross-country flight between Fort Myer and Alexandria, averaging slightly more than 42 miles per hour.

In mid-1910, the Army had but two officers and nine enlisted men on aeronautical duty. Equipment totaled one airplane, one airship and three balloons. Progress in American military aviation might have been interrupted at that point except for the persistence of the Army's Chief Signal Officer in his requests for Congressional appropriations to nourish this fledgling. In the spring of 1911, Congress acquiesced to his pleas and voted its first appropriations for aeronautical development. By modern standards this was a small sum—$125,000.

But this amount, less than it costs to produce a single combat airplane today, made possible the purchase of new equipment. It made possible, too, an aviation school at College Park, Maryland, experiments in aerial photography for reconnaissance, and test-firing of machine guns from airplanes.

Military aviation grew steadily but very slowly until World War I. Then it achieved a sudden and startling growth. By the time of the Armistice in 1918 the airplane had become a major weapon and the first great air strategist, America's Billy Mitchell, had helped to make it so.

The military airplane in World War I is often pictured as a winged charger, which a knight in Sam Browne belt and puttees flew into the blue to engage an opposing knight in personal combat. But the airplane was more than this, as Mitchell realized. It was a vehicle which could leap-frog the battlefield and strike the enemy at his supply points and along his lines of communication. It made possible a strategic concept.

Fortunately, the United States Air Force has fallen heir to the attributes Mitchell exemplified so well—vision and courage: vision to see beyond the horizon just ahead and the courage to get there. As a result, the range of the airplane has continuously been extended. In a generation the airplane has compressed the circumference of the world from weeks of travel to hours of flight.

After forty-six years military aviation has matured into air power, and history is already studded with examples of its use for peaceful purposes as well as in the winning of wars.

As far back as 1919, our Air Service pilots flew forest fire patrols on the West Coast and in four years these aerial rangers discovered more than four thousand fires, saving our Nation untold millions of dollars in valuable timber preserves. The United States Air Force has delivered medical aid to stricken

areas, not only in this country but overseas. We have used the airplane to feed vast numbers of the Nation's cattle, facing starvation in the deep snow of winter. And who will forget the Berlin Airlift?

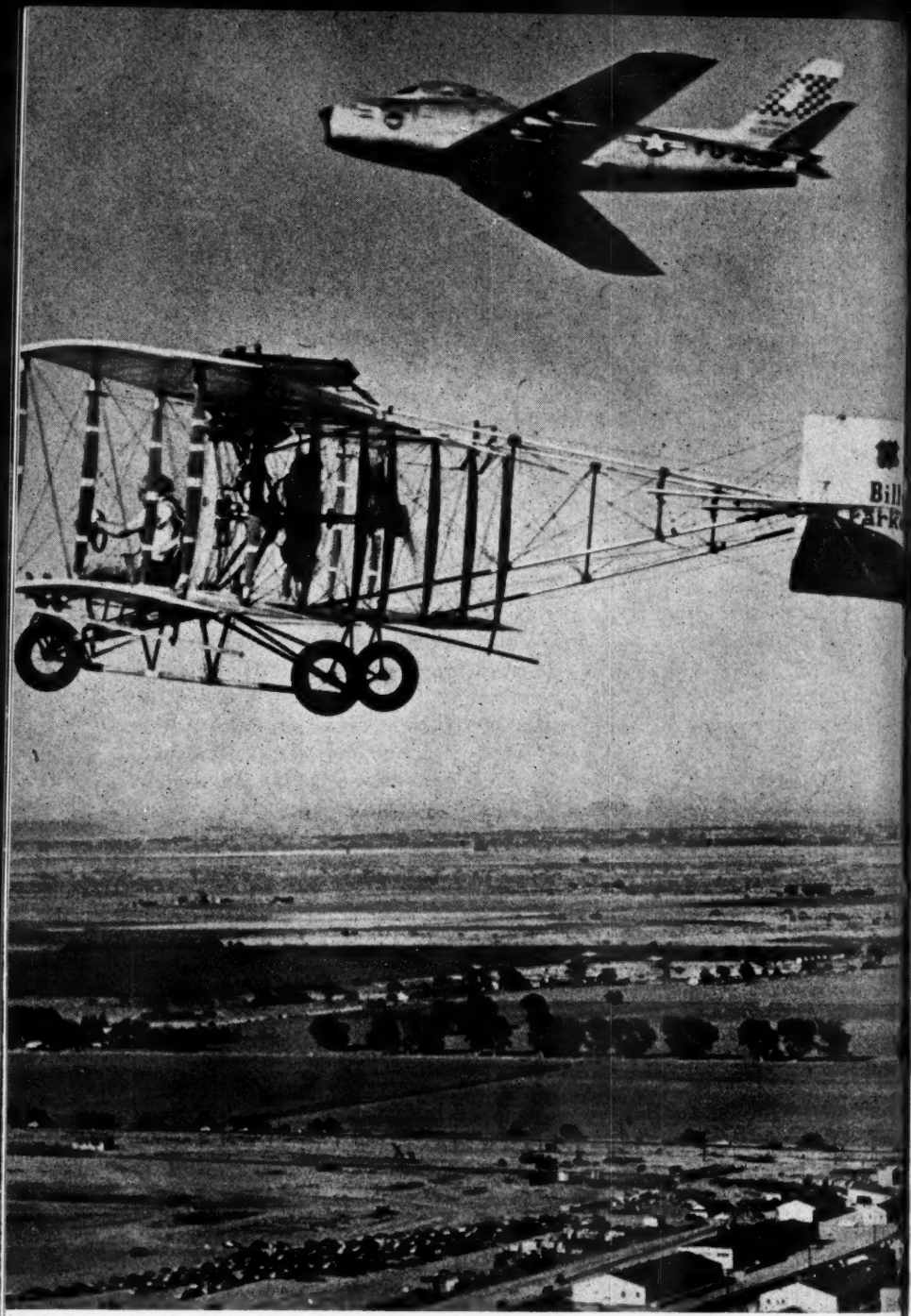
The Berlin Airlift was an unprecedented effort to supply a beleaguered city entirely by air. More than two and one-half million persons, trapped in the Soviet surface blockade of Berlin, became dependent upon the airplane for their necessities of life. To feed, clothe and heat Berlin required a daily average of 4500 tons. The airlift effort far surpassed this minimum. Its unqualified success demonstrated the peacetime application of air power as an instrument of national policy. For although it was carried on by a military force, the Berlin Airlift defeated the land blockade of Berlin without recourse to armed might.

The development of air power has created new problems of defense as well as new opportunities for counterattack but it is neither the principal cause of war nor the principal threat to peace. It is a matter of record that this country has fought three very costly wars in the last thirty-five years despite the fact that no airplane has threatened our homeland. Warfare has been in the world since the dawn of time. Genghis Khan and Attila the Hun were perfectly capable of eliminating entire populations without the assistance of long-range bombers and the atomic bomb.

It is not in laboratories, or aircraft factories, or in flying schools that warfare begins. It is, however, in the union of science, industry and air crew that we must place our dependence for the kind of air superiority that will guarantee our survival if we are engulfed in another war.

On its sixth anniversary the United States Air Force is not unmindful of the debt it owes to those military airmen who have contributed most to the development of air power in America. We owe a debt, too, to the inventors, scientists, designers and men of industry whose interest in aviation has never flagged.

Their legacy is one of the greatest forces for good, or for evil, that the world has ever known. It has been said that applied with humane motives and the intelligence that should be the heritage of our civilization, the product of Kitty Hawk can well bring forth a new Golden Age.



The old and new are contrasted as a 1912 model pusher plane, speed about 60 miles an hour, is passed by an F-86 Sabre jet. U. S. Air Force Photograph

MILITARY AVIATION--
THE FIRST FIFTY YEARS

OWEN J. REMINGTON

IN THE SAME CONDITION as when it was flown in 1909—just six years after the initial successful flight of a heavier than air machine by Orville and Wilbur Wright—the first airplane to be accepted by the Army can be seen in the National Air Museum of the Smithsonian Institution in Washington, D. C. Built by the Wright brothers, this tiny biplane which weighed just 1200 pounds complete with its 30 horsepower engine, full load of fuel and two men, is of special interest today as aviation celebrates the first half century of powered flight.

It is of interest not only for its historical associations but because it remains a link between the early yearnings of man to conquer the air and his present aspirations to conquer airless space. It stands as a physical tribute to all of the now nearly forgotten research and development that made possible the first powered flight.

It is moreover a continuing reminder of the role that the Armed Forces of the United States played in developing air power. While most people consider the acquisition of the first plane in 1909 by the Signal Corps as the start of the present Air Force—and the flight off the deck of a cruiser the following year as the start of naval aviation—actually both the Army and Navy had been interested in aviation even before the Wrights flew their first plane on 17 December 1903.

So swiftly do new developments come today, and so readily are they accepted, that it is difficult to recall that the first flight did not create a tremendous stir, a vast public interest. Interest in the commercial possibilities was limited; there was no grand rush to found an industry. Considerable curiosity, however, was soon generated and it was a poor county fair that did not have some daring aviator as the main attraction. But so little was known of the Wright brothers' accomplishments that as late as

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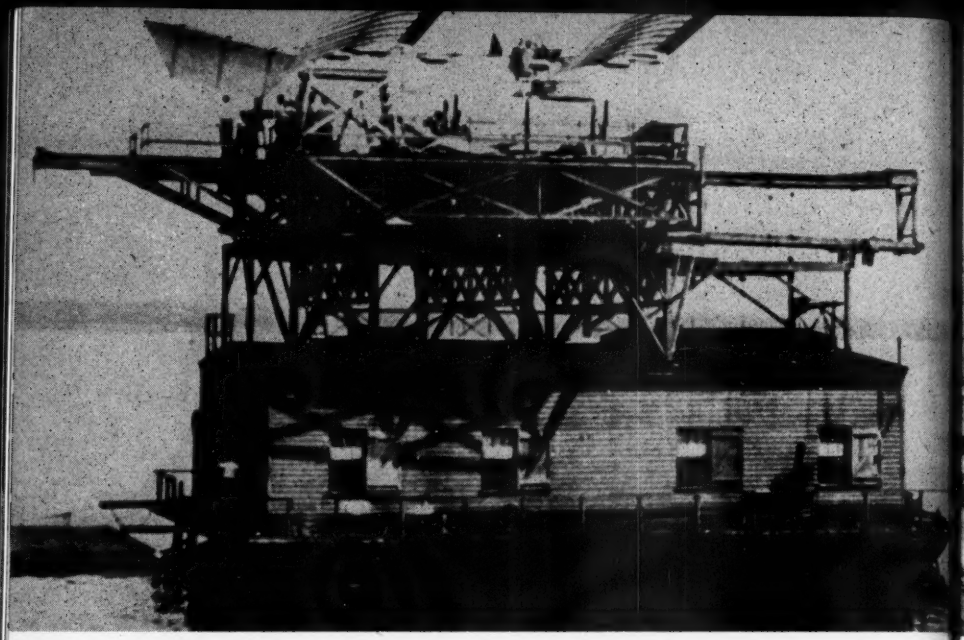


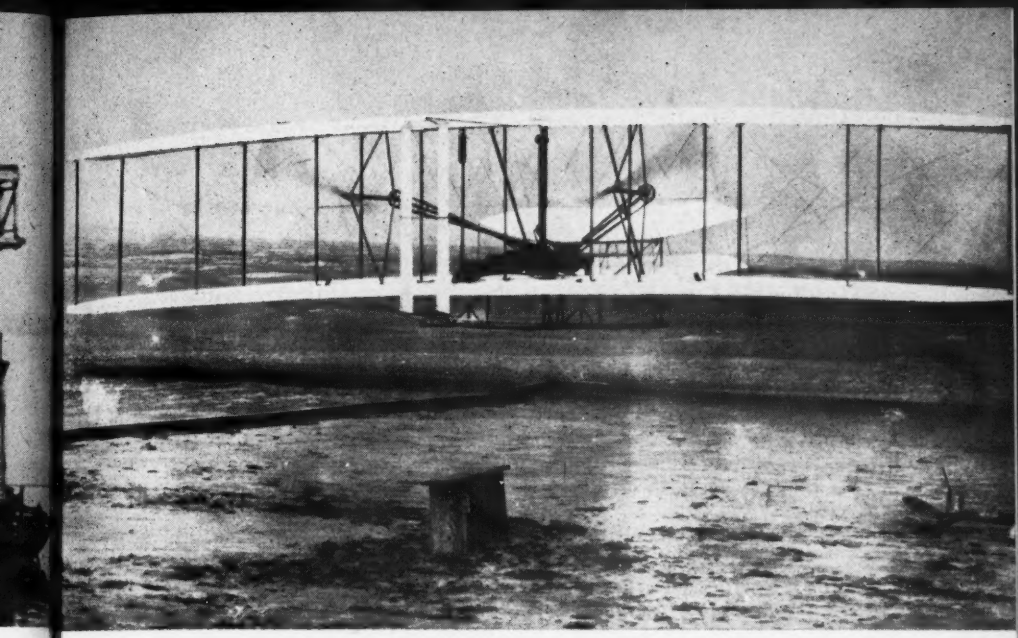
In 1903 Professor S. P. Langley attempted to fly his "aerodrome" from this houseboat in the Potomac River. U. S. Army Photograph

1906, when Santos Dumont, a French balloonist, managed to fly his own machine, he was firmly convinced that he was the first man ever to take to the air.

When in 1907 the Army established in the Office of the Chief Signal Officer an Aeronautical Division "to study the flying machine and the possibility of adapting it to military purposes," the Army was far ahead of the public generally and of European governments in appreciating the novel machine. The new division consisted of one officer and two enlisted men.

In the United States, the Army and Navy were many years in advance of the armed services of any other country in developing the military applications of heavier than air craft. The German Army, for instance, was so engrossed in lighter than air craft—the Zeppelins—that it took actual demonstrations by the Wrights in Europe to arouse any interest at all. Even Graf von Zeppelin's own work has been said to stem from his experience with balloons as an official German Army observer with the Northern forces in the American Civil War.

Both the Army and Navy were deeply interested in early attempts at producing heavier than air craft. Back in 1896 Professor S. P. Langley had succeeded in producing models of steam-engine powered aircraft which flew for three-quarters of a mile. By 1898 Theodore Roosevelt, then Assistant Secretary of the Navy, was writing a memorandum for the Secretary noting "The machine has worked. It seems to me worth while for this



Man took to the air for first time on powered flight in this crate-like contraption on 17 December 1903. U. S. Army Photograph

government to try whether it will not work on a large enough scale to be of use in the event of war. For this purpose I recommen that you appoint two officers of scientific attainments and practical ability, who in conjunction with two officers appointed by the Secretary of War, shall meet and examine this flying machine . . . to make recommendation as to its practicability and prepare estimates as to the cost."

The Navy decided against any participation, however, and the War Department continued alone in its interest and assistance to Professor Langley. A grant of $50,000 finally was wrung from a skeptical Congress and with some funds of his own, Langley went on to build his "aerodrome" as he called it. By 1903 General A. W. Greely, then Chief Signal Officer, was actively supporting Langley's attempt at actual flight. On 8 December, just a few days before the Wright's successful attempt, the Langley steam-powered machine attempted to take off from a houseboat in the Potomac but crashed in the river. In 1914 the same machine, rebuilt and powered this time by a gasoline engine, actually was flown. But Langley—and the Army as well—came in for some severe and bitter criticism in 1903.

It was probably the adoption of the gasoline engine—one designed and built by the Wrights themselves—plus considerable research involving new data on flight characteristics, that resulted in the success of the Wright machine.

The Wrights, who operated a bicycle repair shop in Dayton,

Ohio, had become interested in flight at the turn of the century. They were not alone since "aeronauts"—mostly men who had previously ascended in balloons—both in Europe and America were attempting to build a machine that would fly. Gliders were not uncommon, but they could not be controlled. Reportedly, Wilbur Wright conceived his basic idea when he twisted a pasteboard box in his hands and got the idea of "warping" the wings much as the box was being warped in his hands.

The brothers went to work and built a large kite with two five-foot wings connected by vertical struts, somewhat like a rectangular box open at the ends. With each brother holding two of four controlling strings, they found that they could manage the kite aloft. In 1900 they constructed a glider along these lines and chose Kitty Hawk for experiments because of its prevailing winds. That year they made many flights but probably did not spend more than a total of two minutes in the air. The first glider was controlled partly by the pilot and partly by an assistant manipulating cords from the ground. They became convinced that existing data and air tables—largely based on studies by Langley and Octave Chanute and Hiram Maxim—were not altogether accurate or complete.

During the winter of 1901-02 the brothers contrived a wind tunnel—a box eight feet long and sixteen inches square, through which they blew air with a home made, two cylinder gasoline engine. In this rude predecessor of today's huge scientific apparatus, they studied the wind effects on more than two hundred wing sections that they built. Carefully they noted the effects of air pressure on different types of wing construction.

Using this new information, they designed another glider and in August 1902 returned to Kill Devil Hill at Kitty Hawk. Their efforts succeeded. They were able to sustain glide flights for over a minute, some for more than six hundred feet. They made over a thousand flights, some of them in winds as strong as thirty-five miles an hour. Soon they discovered that they could control their flights and steer their glider by warping the wings. After this step, they realized that only an engine and propellers were needed to make powered flights.

Providing an engine, however, was far from simple. The Wrights had to build their own since there was no gasoline engine on the market that fitted their needs. Then came the problem of propellers. No accurate performance figures were available, even in the related field of marine propulsion.

Accordingly the brothers set to work and finally built pro-

pellers of their own design which tests later showed produced a surprisingly efficient 66 percent of the power expended. Originally planning to build an eight horsepower engine, they found when it was finished that it produced nearly twelve. This allowed more weight for reinforcing the framework. The first engine weighed 179 pounds and generated one horsepower per 15.9 pounds.

With their new machine thus equipped, the Wrights were back in Kitty Hawk in September 1903. Several mishaps caused delays and it was not until 17 December that Orville made the first flight, with Wilbur running excitedly alongside. Only three other persons were present at the history making event. The machine took to the air, flew 120 feet and touched the ground again in 12 seconds. The Wrights made three more flights, of longer duration, in the machine. A few days later a gust of wind damaged the plane badly. Newspapers took but scant notice of the first flight and the Wrights did not attempt to publicize their achievement. They were more interested in building a new machine with improvements.

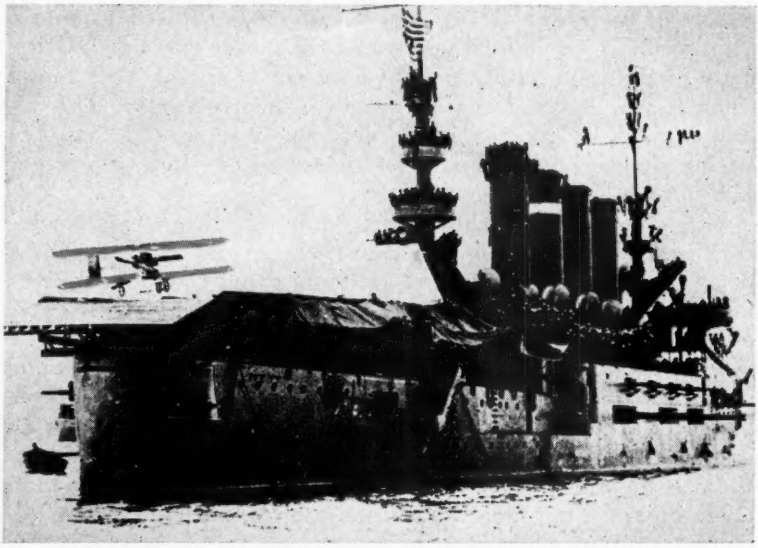
The Wrights' first planes were "pushers," with two propellers mounted behind the wings. In the first one Orville lay prone on a sort of saddle arrangement. Later the pilot sat upright, handling controls with feet and hands.

By the spring of 1904, they were making flights in a larger aircraft, in the vicinity of Dayton. There were still flaws to be corrected, however. They later wrote that "sometimes in making a circle the machine would turn over sidewise, despite anything the operator could do." That same year, however, when they attempted a flight before newsmen, the machine refused to function. The news hawks were skeptical and drifted off.

But by the next year, Orville and Wilbur flew six miles and around Dayton the new machine no longer provoked excitement when it went aloft. The brothers now patented several features of their machine, which they called simply the *Wright Flyer*, and began negotiations with the government and also with European firms to build airplanes and to teach flying. Almost immediately the name "aeroplane" was given to the first aircraft; it was not until much later that the spelling was simplified.

Early Military Uses

American armed interest in aeronautics dated back to the Civil War when a Balloon Corps was organized by Union forces



The first landing on the deck of a battleship was made in January 1911 by Eugene Ely, civilian test pilot, on the specially constructed flight deck of the USS Pennsylvania. U. S. Navy Photograph

to observe Confederate movements. Because reports were carried back to earth by a telegraph wire, the balloon automatically came under administration of the Signal Corps. During the Spanish-American War a balloon was used to direct artillery fire during the battle for Santiago—a little remembered fact overshadowed by the more dramatic event of the "charge up San Juan Hill."

Balloons were used by the French during the siege of Paris while the Prussians were investing the city, and their use captivated the fancy of the German authorities to the exclusion of research in heavier than air machines. In France, however, that country's War Department was financing secret experiments by Clement Ader and his *avion*—which to this day has resulted in a controversy over whether his steam-propelled machine actually flew.

Even with the establishment of the Aeronautical Division in the United States Army, the balloon remained at the core of military aeronautics. In 1908 Captain Thomas S. Baldwin received a contract to develop a dirigible balloon. Specifications called for a speed of twenty miles an hour, with endurance of two hours. The airship remained aloft the required time but managed to average only 19.61 miles per hour. As a result,

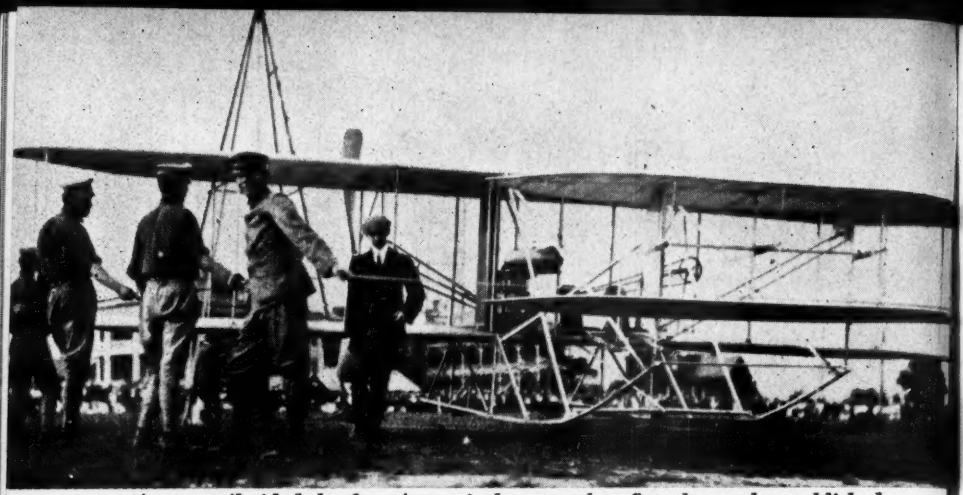
Captain Baldwin had to accept a 15 percent penalty on his costs of $6750.

In the same year the Army Air Service contracted with the Wright brothers to produce the first military airplane. Specifications stated that it must carry two men and fly for one hour at a speed of at least forty miles an hour. On 30 July 1909 the new airplane fulfilled both these specifications, remaining aloft for seventy-two minutes and averaging a little over forty-two miles an hour. Including the bonus of $5000 granted for this performance, the Army's first plane was purchased for $30,000.

By 1908 Glenn Curtiss, who soon after began developing Navy seaplanes, advertised the first commercial plane for sale. In 1909 Louis Bleriot flew across the English Channel—a feat comparable to that of Charles Lindbergh in flying the Atlantic in 1927, considering the time and the state of the airplane's development. In fact this event touched off much the same upsurge of interest in aviation that Lindbergh's flight later evoked. Aviation began to come of age commercially.

In addition to supplying the first airplane to the Army, the Wright brothers contract called for training a flyer. In fact, the first military airman to lose his life in an accident was killed even before the Army had accepted its first plane. Lieutenant Thomas Etholen Selfridge, whose name is commemorated in the Air Force base near Detroit, was killed on 17 September 1908 while on a test flight with Orville Wright at Fort Myer, Virginia. Mr. Wright survived the crash although badly hurt, and continued training the first Army fliers. One of these, Second Lieutenant Frank P. Lahm, later a major general, wrote the book *How Our Army Grew Wings,* replete with reminiscences of the early days of military aviation. Another early flier was Second Lieutenant Benjamin D. Foulois, who was to become chief of the Air Corps as a major general. Still another early student of those days was Second Lieutenant Henry H. Arnold, then of the 29th Infantry Regiment. Lieutenant Lewis H. Brereton also was a pioneer in the air. All later exerted a potent and salutary influence on military aviation.

The Army early realized the significance of the new flying machines but it was another job to convince the Congress that money should be appropriated. On 3 March 1911 the repeated efforts of the Chief Signal Officer bore fruit and Congress voted its first $125,000 for aeronautical development. An aviation school was started at College Park, Maryland, and experiments were conducted in aerial photography. Enthusiastic young fliers



A monorail aided the first Army airplane to take off at the newly established aviation school, College Park, Maryland, in 1909. U. S. Army Photograph

there began tests of armament and equipment for planes.

Although the European governments initially lagged behind the United States in fostering military flying, they quickly made advances when they undertook its development in earnest. But even so, by the outbreak of World War I in 1914, there was no armament on the planes of any of the combatant nations. However, as early as 1912 American fliers were making extensive tests of firing machine guns from airplanes.

When Lieutenant George C. Sweet of the United States Navy was taken for a nine minute ride on 3 November 1909, he became the first naval officer to fly in a heavier than air machine. The following year the Navy was experimenting with flights from the deck of a battleship. In 1910 Eugene Ely, a civilian test pilot for Curtiss, took off from a platform installed on the deck of the cruiser USS *Birmingham.* In 1911 as a feature of an early air meet in San Francisco Bay, Mr. Ely took off and then landed on a similar platform built on the armored cruiser *Pennsylvania.* At the same meet, two officers of the Coast Artillery Corps persuaded some of the exhibiting pilots to test a new bomb sight they had worked out. From an altitude of 1500 feet several live bombs, weighing 36 pounds each, were dropped within 20 feet of the target. In July 1911, the Navy acquired three planes and by the following September had three trained naval aviators.

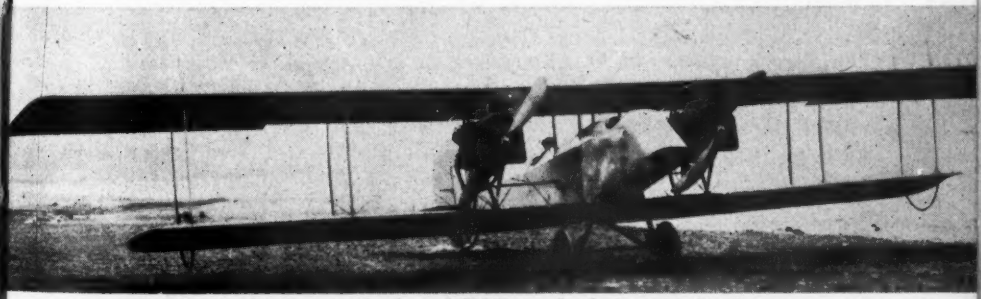
Some of the earliest Navy fliers were Marines. As early as 1912 orders mentioned the "Marine Section of Navy Aviation Camp" which was being set up as a flying school at Culebra, off Puerto Rico. The exact role of Naval (including Marine) aviation in relation to the Army at first appeared simple—let the Navy fly seaplanes and the Army utilize landplanes. But soon it became

apparent that there was no reason why fliers should not take off from the land naval bases as well; consequently in 1915 Josephus Daniels, then Secretary of the Navy, arranged with the Secretary of War for Navy and Marine fliers to receive instruction in land planes and to train Army aviators in seaplanes.

The Navy early experimented with catapults and investigated possibilities of employing ships exclusively as carriers for aircraft. Curtiss experimented with flying boats and soon both flying boats and the hydroplane were in use. The Navy also went in for lighter than air craft and developed the "blimp," a nonrigid type, which performed especially well in World War II on antisubmarine patrol. (See "Airships Have the Right of Way," November 1951 DIGEST).

Flying officers early felt that a purely military aircraft was needed to give more power, speed and load capacity. In 1912 the Army accepted a new Wright plane and a Curtiss—both pusher types not very much changed from the first design. By this time, however, maneuvering was accomplished by rudders, elevators and wing ailerons rather than by warping the wings. The Army Air Service grew to 12 flying officers and 39 enlisted men, with a total of 12 planes housed at College Park and with other hangars at San Antonio and Fort Leavenworth.

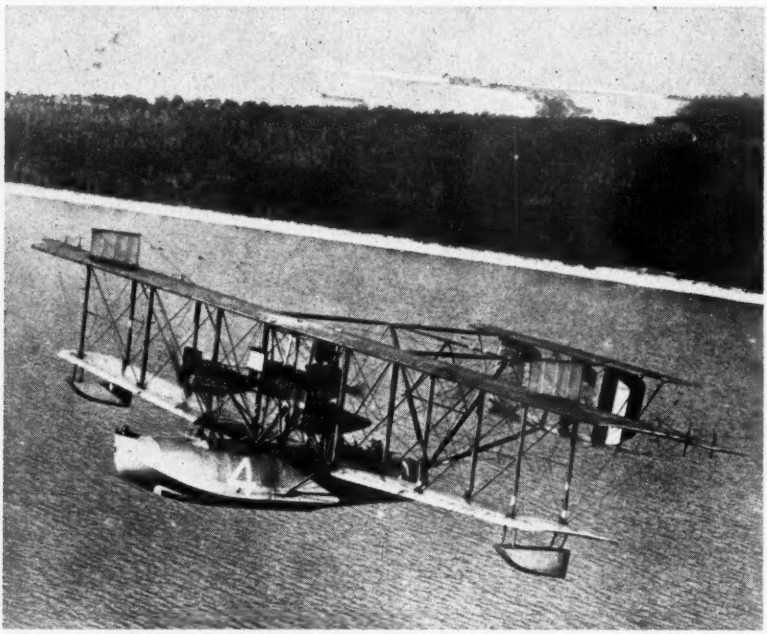
As early as 1912 the War Department decided to test airplanes in a maneuver with ground troops. Seven pilots made several flights with troops who were exercising near New York City and on at least one, Lieutenant Foulois was able to transmit information over a small battery powered radio set he himself had designed. Later however, both he and his plane were "captured" when, being out of range of this tiny set, he tried to land to send some information by cable.



This Curtiss biplane is the famed JN-Twin, built in 1917. In this type many Army pilots received their first taste of flying. National Archives Photograph

The next year, 1913, saw the introduction of airplanes with propellers in front instead of behind the wings. With a Burgess "tractor" type plane, an endurance record for passenger and pilot was set of four hours and twenty-two minutes. On the same flight, incidentally, Lieutenant William C. Sherman, the passenger, sketched the terrain near San Antonio, using a roll of paper ten feet long in what is believed to be the first instance of aerial mapping.

That same year Congress received the first of many proposals for creating a separate Air Force. Although the Military Affairs Committee of the House of Representatives at that time actually



This Navy flying boat, the NC-4, completed the first flight across the Atlantic in 1919. National Archives Photograph

appeared quite favorable, the flying officers themselves were not quite so enthusiastic. Lieutenant Foulois, Lieutenant Arnold and Captain William Mitchell, then a Signal officer detailed to flying duty, believed then that more men, money and airplanes were needed before it would be possible to consider a separate organization. Lieutenant Arnold stated that he believed aviation would do best to remain under the Signal Corps "until able to take care of itself."

But the hearings apparently had good results for Congressional interest in military aviation showed a definite increase. On 2 March 1913 Congress provided 35 percent extra pay for flying. Officer strength in aviators was set at thirty. The next year legislation was adopted establishing an Aviation Section under the Signal Corps, charged with responsibility for operating all military aircraft, pertinent appliances, signal apparatus in aircraft, and aeronautical training. The new law authorized 60 officers and 260 enlisted men and it further established ratings of "Military Aviator" and "Junior Military Aviator," with increases in pay grade respectively of 70 and 50 percent. More important, Congress appropriated $600,000 for development. The Army felt it was making progress in 1914.

Several military and naval "firsts" helped stimulate aviation generally about this time. Glenn Curtiss built a "convertible land-plane-seaplane" and in October 1911 two Navy pilots flew it from Annapolis to Smith's Point, Virginia, making the 79 mile trip in 85 minutes flying time—fast time indeed considering that they had to make two landings for repairs. Also in 1911 Lieutenant Arnold set an altitude record of 4764 feet—first of a series of record breaking hops by military airmen which stimulated interest in flying and in aircraft design. In 1912 Colonel Isaac N. Lewis brought one of his new machine guns to College Park where it was fired for the first time from an airplane. The trial led to the adoption of the Lewis flexible-mount weapon as standard for most American planes used in World War I.

Night flights were attempted by the Army and the Navy and it was proven that night landings could be made both on land and water. The Navy experimented in launching torpedos from airplanes—forerunner of the highly developed techniques of aerial bombing so successful in World War II.

Meanwhile various European governments were taking increased interest in the new machine as a war instrument. Where Congress was appropriating thousands of dollars, European powers were spending hundreds of thousands. Much of Germany's interest, however, still centered in dirigibles, the airplane being considered as useful only for reconnaissance purposes. And the French training manuals still maintained that the ground general could find no substitute for cavalry.

However, the various armies each feared the air power that other nations were building up. It is an almost forgotten fact that the original German mobilization order in 1914 claimed that France had violated German frontiers with an airplane

that had entered from Belgian territory and was bombing the frontier! Later investigation proved this to be patently erroneous, and von Moltke (nephew of the Franco-Prussian War leader) and others were to declare they could not understand how they could have accepted such a report. However, the implication inherent in air power for warfare was clear.

The Airplane in World War I

It is certain that the Germans had at least five hundred military planes in 1914, and while the French had many more, theirs were of a wide variety and pattern not especially suited to military use. England had about two hundred. Ironically the French who had gone in for military aviation quite heavily before the Germans, had for some reason neglected an orderly development of their air power.

By this time military planes using 200-horsepower engines and capable of 600-mile range could climb to around the 13,000-foot mark. In Germany and France the biplane was giving way to the monoplane. Russia was developing a multi-engined plane, sponsored by the later more famous Sikorsky. Many pusher types were still in use. Naval planes were equipped with pontoons and some flying boats were in service. A few three-wing planes were used by Germany and Italy.

The French are credited with being first to mount a machine gun in front of the plane. In effect, this made the plane a gun-mount, the entire aircraft being brought into line to fire on target. Later swivel mounts were adopted. But firing through the propeller created a problem. The French tried using steel guards on the propellers but soon a method was evolved of synchronizing the guns with the engine so that they fired between the revolving propeller blades.

Under the impact of World War I the demand grew for more power, more speed, more maneuverability, greater radius of action, greater carrying capacity and higher altitude. The demand has not ceased since. Even during World War I some planes were obsolete before they came off the drawing boards. Improvements were made, Henry H. Arnold (by this time a major) noted, "as a result of employing more efficient wing sections, a substantial reduction of head resistance, a decrease in the dead weight resulting from the use of stronger and lighter materials of construction, and as a result of having more reliable engines that weighed less per horsepower. . . ."

Although the spectacular feature of aerial warfare known as dog-fighting captured the imagination of Americans in World War I, actually the development of strategic and tactical bombing, aerial mapping and photography, antisubmarine patrols, ground support tactics and development of antiaircraft weapons and methods were of much greater military significance.

In this country the war in Europe naturally focussed attention on military aviation. Extensive experiments were started. One result was adoption of a portable airport for field use, complete with machine shop, reserve fuel, extra equipment and spare parts, even a tent type hangar. But nothing much was done to prepare any part of the Army—let alone the fledgling Air

When Army fliers made their historic flight around the world in 1923, President Calvin Coolidge inspected the planes. National Archives Photograph

Service—for the coming entry of this Nation into the war. By this time the Air Service could boast of the First Aero Squadron, which had been organized in San Diego in December 1913 as the first United States tactical aviation unit.

The Navy gained valuable experience in the Vera Cruz "incident" in 1914. President Woodrow Wilson had ordered the Navy to Vera Cruz when trouble arose during one of the many revolutions of the period. Naval fliers made reconnaissances and on a photographic mission, one plane was hit by rifle bullets. One result of the incident was to reveal shortcomings of the new flying boat.

By the time of the Mexican border incident in 1916, the First Aero Squadron consisted of 11 officers, 82 enlisted men and one civilian mechanic, under command of Captain Foulois.

The men had available eight of the thirteen planes then owned by the Army—none in very good condition. On 15 March 1916 the Squadron was ordered to Columbus, New Mexico, as part of the expedition to the Mexican border. Its initial mission was to fly to Casas Grandes, Mexico, for immediate operations.

In view of the vast strides made by the European warring armies by that time, the results showed only too drastically the American Army's great weakness in the air. One plane had to return to Columbus because of a defective engine. Three were lost and forced down in Mexico. The remaining four landed due to darkness and next day one could not gain sufficient altitude to cross the Sierra Madre mountains. Another cracked up while making a landing.

The tiny squadron remained at the border for a month and did some scouting work in addition to carrying mail and dispatches. By 22 April, when it returned to Columbus, six of the eight airplanes had been abandoned or destroyed and the remaining two had to be condemned!

This experience clearly emphasized the need for higher-powered aircraft and soon Congress appropriated $500,000 to strengthen the Aviation Section. With this newly acquired "wealth," the Army was able to purchase 12 Curtiss R-2s equipped with 160 horsepower engines. And by 3 June the National Defense Act was passed, building up our armed strength generally. One provision increased the authorized strength of the Aviation Section to 148 officers and prescribed that the President would set the enlisted figure over a period of five years. But of course, no such time was to be available.

While the United States in 1916 was appropriating $500,000 for new airplanes, European countries were appropriating millions. Their aircraft factories were in full production whereas in the United States scarcely any industry as such existed. All together, the Army had 142 planes; its Aviation Section had 131 officers and a little more than a thousand enlisted men, divided among seven squadrons. Of the 78 flying officers, none had enough training for combat and of the 55 planes on hand, not one was suited for battle.

Such was the status when the United States entered World War I in April 1917. Less than a month later the Allies asked that the United States provide 4500 aircraft, 5000 pilots to fly them, and 50,000 ground troops to maintain them! Not even a blue print of a plan existed for such a tremendous expansion.

Despite the record of military aviation being made in Europe,

The mail goes through as air mail service is inaugurated from Chicago to New York in 1918. National Archives Photograph

the airplane in 1916 was still considered as an unproven quantity. Anything spent on airplanes meant just so much less for the desperately needed proven arms.

At the same time, the public was demanding increased air power—and so were our Allies. President Woodrow Wilson called on the new Advisory Committee on Aeronautics for an evaluation of American aircraft. Type for type, the committee stated after a study, American airplanes could equal those being produced in Europe. The Committee recommended that the United States build 3500 planes the first year and train 5000 pilots to fly them, the figure to be doubled in the ensuing year. Congress was told that at least $600,000 would be required for such a program during its first year.

By 27 May the joint Army and Navy Technical Board was recommending a goal of 10,000 training planes to train the necessary pilots to fly a required 12,000 war planes. In addition, it advised, industry should be geared to turn out 24,000 service engines and another 21,000 training engines. This recommendation was endorsed by both the Secretaries of War and the Navy.

Because of American industry's success in mass production of automobiles, it was generally considered that there should be no trouble in making planes. A few conversions in the automobile shops and presto, out would pour swarms of airplanes. But the airplane of that day was not adapted for speedy production. Largely built of wood and cloth, it could not be stamped out and assembled by mass production methods. So much faith was placed

in the whole idea, however, that the American public did not take kindly to the hard facts of the situation. After the war, sharp questions were asked as to why American fliers had to be equipped with European-built planes.

But in the fabrication of engines it was a different story. Almost overnight plans for the now famous Liberty engine were turned out and, comparatively overnight, they were in production. In the first year, industry produced 11,000 of the new 12-cylinder engines and by the end of another six months, the figure leaped to a startling 15,000.

Under the spur of war, prospective fliers were soon being trained at ground schools established at several universities. The need for speed and more speed led to the adoption of new training methods. Men were taught to fly, to operate radios and machine guns and aerial photographic equipment, and a myriad of other subjects.

Although the building of American fighters and bombers never matched the thousands envisaged in the popular mind, the Curtiss Company was able to turn out its JN4—the famous Jenny —in which most American pilots were trained to fly. After the war hundreds of surplus Jennies played another important role. They were snapped up by young flying enthusiasts who went out "barnstorming" or flying the new mail routes. In fact these aircraft formed a large part of the Air Force planes as well, for some considerable time.

Meanwhile it was decided to concentrate United States wartime manufacturing efforts on the DeHavilland 4. Equipped with Liberty motors, this type was designed as an "all-purpose plane suitable for bomber and fighter use, for pursuit and reconnaissance." Until the DH-4s could roll off the line in quantity, newly trained fliers were rushed to France and organized and equipped largely with available French and a few English planes.

In a wartime reorganization, the Signal Corps was relieved of jurisdiction over military aeronautics. And in Europe General John J. Pershing reorganized the American Air Service, American Expeditionary Forces.

Despite all the confusion and frustration, American flying units began to arrive in France by the fall of 1917 and in April 1918 the First Aero Squadron was in action, flying British Spad two-seater observation planes. On 14 April Americans got their first taste of aerial victory (except for those who had served earlier in the renowned Lafayette Escadrille with the French) when Lieutenant Alan F. Winslow and Lieutenant Douglas

Campbell shot down two German planes over the Toul airdrome. Within a short time the 96th Squadron, with French Breguet bombers, was successfully bombing the railroad yards at Dommary-Baroncourt, near Metz.

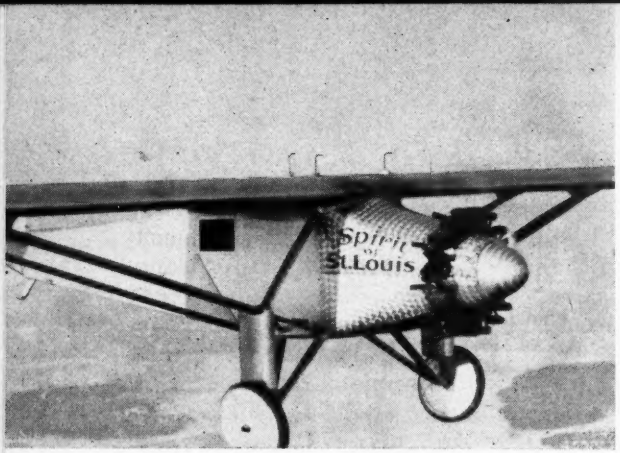
The first major organized United States air operation came in July 1918 as part of the attack at Chateau-Thierry. In this action the Americans suffered some grave losses, notably the death of Major Raoul Lufberry, who had earlier established himself as an ace by bringing down more than a dozen Germans while serving with the Lafayette Escadrille. However, the Americans learned enough from this operation to organize a 1500-plane attack during the Saint-Mihiel salient offensive in September. Brigadier General William Mitchell planned this strike.

By the time of the Armistice in November 1918, the Air Service had 45 squadrons with 744 pilots, 457 observers, 23 gunners, in 740 planes. Air Service crews made 13,000 pursuit flights, more than 6600 observation flights, dropped 275,000 pounds of explosives in more than 150 bombing raids and had flown a total of more than 35,000 hours over enemy lines. In operations abroad, Navy aircraft (including Marine Corps pilots) on patrol and bombing attacks logged 791,398 nautical miles, not including flights of aircraft operating with Allied units. They dropped 126,302 pounds of bombs on German submarine bases and military targets, and attacked 25 German submarines, sinking or damaging 12 of them.

Less than a quarter of the Air Service units were equipped with American-made planes. Late developments in aircraft included the introduction of armor. Major Lufberry is believed to have been lost when he came up against one of the first German planes so equipped. Americans were experimenting, too, with guided missiles but these were developed too late to have any effect and after the war the experiments were dropped. Fliers did not like the idea of being "burdened" with equipment such as armor or parachutes. As a result many casualties were suffered that could have been avoided through use of the parachute. (See "Parachutes Aloft," July 1951 DIGEST.)

Despite the disappointment over the "failure" of the American aviation industry, the fact is that by the end of the war productive capacity had grown to a potential of 20,000 planes a year. Hundreds of young Americans caught the flying fever. A whole literature sprang up about flying and several magazines flourished. Interest in aviation became widespread.

But even so, the new airplane industry found itself in serious



This Ryan high wing monoplane carried Charles A. Lindbergh from New York to Paris in 1927.
U. S. Air Force Photograph

straits. After the war there was practically no military demand and almost no commercial orders for planes. Several of the new aircraft factories closed. The young fliers who went into barnstorming or carrying passengers were able to supply their requirements from war surplus planes. The Jenny became the mainstay of American aviation for several years.

The first scheduled airline had begun operation on New Year's Day 1914 when a flying boat was put into service between St. Petersburg and Tampa, Florida. The boat had a capacity of exactly one passenger and the line closed after three months. The war delayed commercial development but by 1919 the first municipal airport was opened at Atlantic City, New Jersey.

Commercial Peacetime Uses

Also by 1919 the Curtiss Company was demonstrating its eight passenger Eagle, the first plane built for actual transport purposes. At about the same time, Martin modified its twin-engine bomber to make a transport capable of carrying twelve passengers. Curtiss flying boats were operating a regular service between Pacific Coast cities and Catalina Island. By 1 November 1920 the first passenger airline was established, covering the 100 miles between Havana and Key West, Florida.

Even in the midst of war, the Post Office had established its first air mail route. Deliveries were started in 1918 from Washington to Philadelphia to New York. Mail was flown in Jennies by Army pilots until the Post Office Department took over a few months later with its own personnel. Within a year mail was flying in De Havillands between Cleveland and Chicago; later this run was linked to the eastern mail route.

In the early days it was a great point of honor to "keep the mail flying" and the early pilots managed it day and night without the aid of radio, winging through fogs and storms over airways that were either poorly marked or not at all. Some farmers

A new sustained flight record was set by the Question Mark *which was refuelled in flight in 1929.*
U. S. Air Force Photograph

along some of the routes agreed to light bonfires if they heard a plane at night. Later the Post Office Department was able to build emergency airports and set up flashing beacons. To those early efforts at flying the mail must go the credit for much of the later success of the airlines and the development of aviation.

At the same time, considerable credit for maintaining popular interest and for advancing technical improvements must go to the Armed Forces. Little remembered today is the bold flight of the Navy to be the first to conquer the Atlantic. During the war the Navy had contracted with Curtiss for flying boats, much improved over the 1914 models, but the first of these was delivered too late for war service. However, three flying boats, NCs as they were called, attempted the Atlantic crossing in 1919. The NCs were heavy biplanes, each with four Liberty engines driving a four-bladed propeller.

The three planes left Rockaway Beach, New York, for Trepassey, Newfoundland, on 8 May 1919. They were to leave Trepassey as soon as possible via the Azores and Lisbon to London. On 16 May the first of the three took off. One, the NC-1, landed in rough seas to take bearings and was so damaged that she was unable to resume her flight. Another, the NC-3, came down to get her bearings about forty-five miles from Flores, but despite damage made its way on the surface to Horta harbor in the Azores. There the persistent crew found that the NC-4 had accomplished the entire trip—first to navigate the Atlantic. Credit for the first actual non-stop flight of the Atlantic, however, goes to a pair of former Royal Flying Corps officers, Captain John Alcock and Lieutenant Arthur Brown, who flew their Vickers-Vimy bomber from Newfoundland to Ireland in June 1919.

At this time the Navy under guidance of Admiral William A. Moffet was pioneering in naval air tactics. Endurance of 300 hours, rather than the former 50 hours, was specified for acceptance tests. This led manufacturers to improve magnetos, oil and water pumps, spark plugs and generators. The first United States-

By 1940 large carriers were being used to transport troops. Here a squad leaves a Douglas B-18A at March Field, California. U. S. Air Force Photograph

made radial engine, the Lawrence D-1, was a nine-cylinder, 200 horsepower engine with very low weight-per-horsepower ratio.

Public interest and imagination was stirred again in 1920 when four Army planes completed the first round-trip flight from New York to Nome, Alaska. Two years later Lieutenant James H. Doolittle flew across the continent in just a little more than 21 hours. Also in 1922 the Army set a speed record of 171.7 miles an hour with a newly streamlined plane. By 1923 experiments were made in mid-air refuelling and 1924 saw the first round-the-world flight by four Army fliers. Admiral (then Lieutenant Commander) Richard E. Byrd made more history with a flight over the North Pole in 1926. Military aircraft were being used in aerial map-making surveys, an accomplishment that was of inestimable value to civilian commerce. Army aircraft bombed an ice jam in the Platte River in 1924 to avert a flood.

As a further aid to aviation, Secretary of Commerce Herbert Hoover in 1922 set up the first Air Industry Conference. In 1926 the Government authorized contracts for air mail to commercial flying lines—an important step in aiding them financially.

Probably the greatest spur to aviation came when Charles A. Lindbergh, an Army Reserve flier, early barnstormer and mail pilot, took off in a small monoplane, the *Spirit of St. Louis,* from Roosevelt Field, Long Island, and thirty-three hours later landed at Le Bourget Airport in Paris. This resulted in so much public

acclaim and attention that air travel spurted tremendously. Aviation was catapulted into an entirely new era by the end of the 1920s.

Militarily the decade of the '20s has sometimes been called the "Billy Mitchell era"—the same General Mitchell who had mounted the impressive demonstration of massed air power when he put 1500 planes into the air in the St. Mihiel offensive. Mitchell grasped then, if he had not already done so earlier, the full import and potential of air power. He began trying to convert the American public, the Armed Forces, Congress, and the world generally to his ideas by any means at his command.

Even during World War I, General Mitchell began to seek equal status with Army and Navy for the air arm. Now his public statements turned not only to that end but to claims that air power had replaced the fleet as the historic "first line of defense." He claimed for the airplane the role of a strategic weapon, rather than purely tactical or as "eyes" of an army or fleet. Finally Congress requested a comparative test of the claims. In July 1921 General Mitchell led his airmen, armed with 600-pound bombs, to sink a captured German destroyer and light cruiser. Following this, Mitchell attacked the dreadnaught *Ostfriesland,* which had a triple hull and water-tight compartments. Mitchell ordered his pilots to try for "near misses" which, together with direct hits, sprang the battleship's seams and sent her to the bottom. Despite this feat, the word battle continued.

One result of this was the appointment by President Calvin Coolidge of an Aircraft Board, now known as the Morrow Board after its chairman, Dwight W. Morrow. This led to adoption of the Air Commerce Act of 1926 and the Five Year Program Acts of 1926 for both Army and Navy.

The Air Commerce Act has been described as the "legislative cornerstone for the development of civil aviation." Under it the Government assumed responsibility for building airways and maintaining various aids to navigation. Aircraft were registered. Minimum standards of airworthiness were set up and, what is more, were enforced.

Further recommendations of the Morrow Board included establishment of a Bureau of Air Navigation in the Department of Commerce to advance civil aviation; a continuing research and procurement program; continuity in orders for military aircraft to help establish a sound industry; elimination of government competition with civilian industry; and creation of new training bases for military aviators of all services.

Thus it was that the activities of General Mitchell actually resulted not only in new concepts of aerial warfare, but gave tremendous impetus to expanded operations of commercial aviation also. The Air Commerce Act quickly resulted in establishment of the present Federal airways system. In 1926 there were 2041 miles of controlled civil airways; a year later it had doubled and by 1930 had increased to 15,258 miles. By the end of 1950 there were 70,253 miles.

In 1920 Congress passed an Army reorganization act which created a new Air Service, with an authorized strength of 1516 officers and 16,000 enlisted men "as a separate and co-ordinate branch of the line of the Army." Ninety percent of the officers were to be pilots or observers. Flying units were to be commanded by flying officers. Actual strength that year consisted of 155 regular and 1013 temporary officers and about 7800 enlisted men in the Air Service. In July 1926, the designation Air Service was dropped with creation of the Office of the Chief of Air Corps.

During this period the Air Service maintained considerable interest in lighter than air ships. It was agreed that the Army would specialize in non-rigid types while the Navy would develop the rigid craft. In 1920 the Army received the *Zodiac,* former French craft which was the largest airship in service, 260 feet long with gas capacity of 328,000 cubic feet. Rechristened the DZ-1, it was used for experimental work in bombing, radio and aerial photography. Later the same year the Air Service purchased the *Roma* from Italy. In 1922 it crashed and exploded in flames. As a result of this accident, helium was substituted for hydrogen in lighter than air craft, a move that had a far reaching effect since the United States had a virtual monopoly on helium. But by 1937 the Air Corps turned over to the Navy its last non-rigid training ships. From then on, the Navy has maintained lighter than air service, largely for antisubmarine work.

Although the United States engaged in no declared war during the 1920s, American fliers were gaining actual combat experience. This occurred when the Marines were sent to Santo Domingo and Haiti in 1919 and into Nicaragua in 1927. In all instances they were operating against bandits or rebel groups. They established regular mail service, delivered supplies, took aerial photographs and participated in combat as well. In 1919 a Marine flier in Haiti, Lieutenant L. H. M. Sanderson, experimented in aiming his plane at a target and diving to about 250 feet at a 45 degree angle to release the bomb. Pilots of the small squadron there adopted the technique as a regulation maneuver.

During World War II so much was written about German "dive bombing" techniques that most people still consider that the Nazis discovered the idea. Actually the German ace, Ernst Udet, who designed the Stukas which so terrorized Europe in World War II, is believed to have appropriated the idea after he had observed a display of dive bombing at the Cleveland air races. Previously the principle had been used by Marine fliers against the Sandinistas in relieving a beleaguered Marine garrison in 1927, thus demonstrating its effectiveness against personnel. The Marines were to bring a high degree of specialization to low-level attacks launched in support of ground troops. Later in the same year, 1927, the Marines staged the first known instance of an air attack directed by ground troops.

Thus, even during peacetime, American aviation was gaining knowledge of military techniques. In Nicaragua also, incidentally, Marine cargo carrying operations were started, to give impetus to the later vast cargo carrying feats performed in World War II by all services, and later still in the Berlin Airlift.

In the Army during this period, however, the accent was on peacetime developments. In 1926 the young Air Corps dispatched a good-will mission to Central and South America. It toured 22,000 miles of the Latin American countries before returning in May 1927. A month after that, two Air Corps fliers completed the first non-stop flight from continental United States to Hawaii, covering more than 2400 miles in 25 hours and 50 minutes. On New Year's Day, 1929, Major Spaatz and Captain Ira C. Eaker began the memorable flight of the *Question Mark* which took off from Los Angeles and remained airborne almost 151 hours, covering more than 11,000 miles with the help of mid-air refueling.

By the end of the 1920s, aircraft manufacturers were producing bigger and better transports. Flights were begun between Chicago and San Francisco and in 1929 regular service to Brazil was started. The airplane also was making its influence felt commercially. Gasoline refineries developed higher octane fuel for airplanes. Radio manufacturers, tire makers and others were finding increased markets.

Another feat that captured the public imagination was the flight over the South Pole by Admiral Byrd and Bernt Balchen (now a colonel in the Air Force). Planes and engines exposed to extreme weather conditions dramatized the dependability of improved aircraft and helped advance aviation generally.

Development of the Federal Airways System was making it

possible for pilots to fly despite adverse weather conditions. Lieutenant Doolittle added considerably to public acceptance of flying when he demonstrated the first blind flight in 1929—although actually pilots had long previously been practicing instrument flight. On 22 December 1929 the first ship-to-air radio telephone communication was conducted.

The early years of the next decade produced more important developments in aircraft design. These mainly were the new monoplane design and the growing use of all-metal construction, retractable landing gear and reinforced wing members. The first all-metal bomber, the B-9, a midwing monoplane with retractable landing gear, was accepted in 1931 from Boeing. In the same year the Curtiss Company introduced the A-8, an all-metal attack monoplane. These were followed quickly by larger, speedier all-metal planes, especially bombers. In July 1934 Lieutenant Colonel Arnold led a reconnaissance mission of ten bombers to Alaska where a base was set up at Fairbanks.

A major contribution to scientific knowledge was made in 1935 when Captain Orvil Anderson and Captain Albert Stevens made a record ascent of 72,395 feet in the largest balloon ever built, the *Explorer II.*

It was in the same year that Pan American's huge flying boat, the *China Clipper,* a four engine type, made a record hop from San Francisco to Manila. A short time later regular passenger service opened to the Orient. Also in the same year Douglas produced its now famed DC-3 which soon was standard equipment on many American airlines.

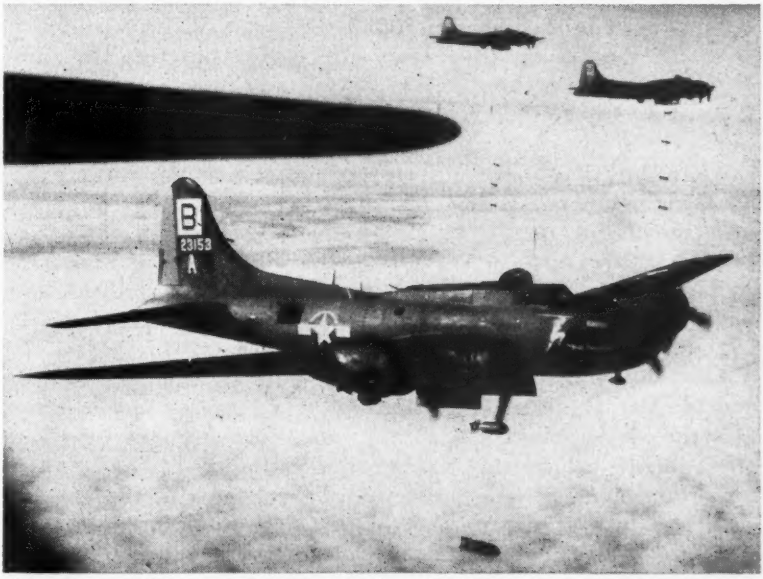
These large multi-engined aircraft were followed a year later in the military field by the Boeing four-engine B-17 Flying Fortress. This was the culmination of three years of planning and research, urged on by Major General Foulois, who had become Chief of the Air Corps.

With the advent of large transport planes, the story of airlines has been one of continuous growth in passenger traffic. But earlier the established airlines had found it more profitable to carry mail. When the first contracts were let in 1926 it assured them a steady income; in fact some airlines did not even install seats for passengers. This was regarded as an unhealthy state of affairs, and in 1929 Postmaster General Walter Folger Brown was instrumental in persuading Congress to allow payments on volume of space available for carriage of mail, rather than actual poundage. This enabled the airlines to purchase larger planes and thus provide for passenger traffic.

However, this caused some dissatisfaction among smaller airlines and considerable controversy arose over air mail contracts. Finally in 1934, after a Senate investigation into awarding of contracts, President Franklin D. Roosevelt cancelled all mail contracts and ordered the Air Corps to take over. The Air Corps, however, was not equipped for such a move and several bad accidents occurred. This was a jolt to many Americans who were unaware of the needs of the Air Corps for more and better planes and properly trained personnel; but it helped gain a better understanding of those needs. Another result was the passage four years later of the Civil Aeronautics Act which for the first time set up a comprehensive governmental code to guide, strengthen and police all aeronautical activities.

The Civil Aeronautics Act of 1938 made the airlines more stable. Some of the lines were now weathering the great depression and were beginning to show profit. By 1940 they were doing a gross annual business of $77,000,000. But by this time, World War II had begun.

The outbreak of war in Europe in 1939 found the United States again weak in military aviation. The five year plan adopted in 1926 had given impetus to procurement of planes



"Bombs away!" as B-17 Fortresses make a daylight bombing run in an attack on Wilhelmshaven, 3 November 1943. U. S. Air Force Photograph

but, as was clearly shown by the airmail tragedies of the mid-thirties, the young Air Corps was in need of planes and pilots. The depression was hurting here as everywhere else. And during those years the increased range and carrying capacity of the airplane was dwarfing world distances, rendering practically every place on the globe vulnerable to swift aerial attack.

By 1937 the United States had dropped to sixth place among major world powers in combat airplane strength. At the same time European nations, exactly as before World War I, were building their air strength. As the realization of this began to be appreciated by government officials, one move was the demand by President Roosevelt for 50,000 war planes. Another was the creation of Army Air Forces in 1941. Major General Arnold, who had been Chief of the Air Corps, was placed in command. A tremendous expansion was feverishly begun. With orders placed for thousands of planes, pilot training was stepped up to 33,000 for the year. Schools were established for technical specialists needed to maintain the planes and airfields.

Unlike the days of World War I, American airplane manufacturers this time proved that they were now geared to turn out the necessary airplanes swiftly and efficiently. Readiness had been spurred by foreign orders; manufacturers were tooled up and already in high production.

World War II saw the Army Air Forces put into play the concept of strategic bombing in Europe and later against Japan. It also saw the tremendous development of the carrier concept in naval warfare. As early as 1922 the Navy had started building carriers; but as with other phases of military aviation, the Navy was long hampered by lack of funds. The concepts, training and experiments in tactics that had been carried on, however, proved fruitful and the carrier became the center of the naval striking forces. This was the first war where large and decisive naval engagements took place with fleets never actually coming in sight of each other.

Tactical aviation played a major part in the Air Force's World War II effort. The concept of air-ground operations—*i.e.,* the air support of ground troops—first brought into full effect during the North African campaign, proved to be of great importance during land battles in Europe and in the Pacific.

Interdiction—the cutting off of supplies and communications with the battlefield—also made a great contribution to the Allied victory.

The attainment of air superiority over the battlefield was a

vital Air Force objective during the war. Except for the early days of the North African fighting, American troops always fought under skies controlled by friendly air forces.

American air planners believed in the feasibility of daylight strategic bombing. Skeptics held that daylight precision bombing was foolhardy at the very least, that losses would be so high as to reduce the bombardment potential. But the very first attempt was successful and daylight assaults were carried on through the war. In Europe, German production of fuel and lubricants was seriously damaged while the *Luftwaffe* was practically destroyed.

In the Pacific, carrier-based planes not only fought naval engagements but were used tactically to soften up islands as American forces advanced against Japan.

Throughout the war in the Pacific, B-17 and B-24 bombers repeatedly atacked enemy installations from long range. In June 1944, the 20th Strategic Air Force equipped with B-29 Superfortresses, began concerted attacks on the Japanese home islands. Japan was already reeling from these attacks when the 20th capped its efforts with the atomic bomb drops on Hiroshima and Nagasaki.

As happened in World War I, the demands of war gave impetus to technical improvements—with resultant benefit to aviation generally. Manufacturers were called upon to build into their planes greater maneuverability and range, along with greater visibility. Self-sealing gasoline tanks were introduced. The planes continued to grow larger as well as swifter, thus making it possible to deliver more bombs deeper and deeper into enemy territory. Armadas of a thousand planes became commonplace as air strategy led to mass bombings.

The airplane also was creating a new method of attack as paratroopers were employed for the first time. The Douglas DC-3 was converted for military use as the C-47 and carried huge loads of materiel all over the world. It became known as the workhorse of the Army Air Forces.

The war proved the value of previous assistance to civilian airlines. The Air Transport Association had arranged with the Air Corps to put America's air fleet to priority use. As early as 1938 General Arnold worked out plans with leading flying schools so that, five years later, fifty-six of these schools were under contract, working under supervision of the Flying Training Command. Sunday sports pilots soon were flying missions for the Civil Air Patrol. But more important probably was the

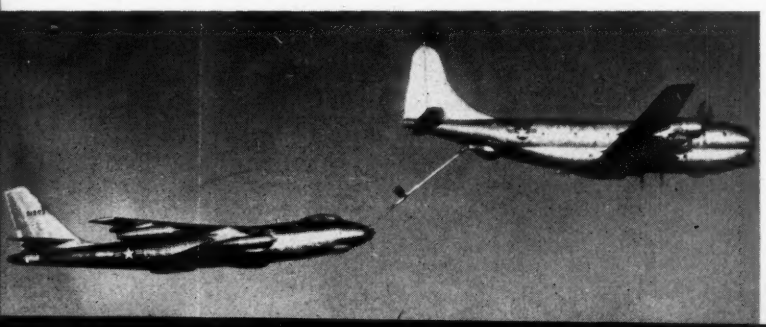
fact that within a few days after Pearl Harbor, nearly every one of the seventeen existing airlines had contracted with the Army or Navy to fly domestic or foreign military routes.

Despite the increase of air travel there were only about four hundred transports in operation at the outbreak of war, and about half of these were taken over by the Army. But by rescheduling flights to provide volume rather than convenience, the airlines were able to provide almost as much service as had been available previously.

The great conflict also resulted in developments both in jet engines and in guided missiles. The dropping of the atom bomb on Hiroshima in August 1945 ushered in the atomic age. Although this cannot be credited to aviation, the bomb was dropped from a B-29 and present developments in atomic energy are pointing the way to a wider use militarily of atomic energy.

By the time the war was over, about 300,000 military airplanes had been produced for America and its allies. The Army Air Forces alone had conducted more than 2,300,000 combat sorties, dropped more than 2,000,000 tons of bombs, destroyed more than 40,000 enemy planes, suffered more than 120,000 battle casualties. More than a million and a half persons were graduated from technical training courses and many thousands of other young men had been trained as pilots. In the Navy, there were 28 fast and 71 escort carriers operating with the combat forces by the the time the war ended. Naval aviation, at V-J Day, had 41,272 planes, 60,747 pilots, 376,777 officers and men.

Following the war, both Army and Navy forces again suffered a contraction comparable to the retrenchment after World War I. The mighty armadas of planes were grounded; personnel were cut back severely. Airlines that had switched from peace to war almost overnight were caught unprepared for peace. They had been unable to add new planes during the war and were not equipped for the unprecedented demands of passenger traffic. The airlines were in the position of having more potential business than they could serve. Local service airlines, air freight, air coach service, non-scheduled airlines for both passengers and cargo, and competitive foreign air networks mushroomed. The



Refueling has come a long way from the day of the Question Mark. *Here a B-47 Stratojet is refueled by a KC-97A Stratofreighter in flight.*
U. S. Air Force Photograph

immediate postwar years were rocky ones financially for some companies. But by the time the airlines had completed replacement of old equipment with the ultra-modern types, those that survived faced a brighter future.

Militarily, however, the downward spiral continued. In the waning months of 1945 the world's greatest air force was swiftly demobilized. Serviceable aircraft fell from a wartime high of 80,000 to about half that number. By June 1947 personnel strength had dipped to 205,827 and of just 38 groups left, only 11 were considered operationally effective.

At the same time, great advances were being made in research, development and design, both in the United States and abroad. Huge laboratories manned by highly trained scientists and technicians, employing equipment and machinery that the Wrights could not possibly have dreamed about, continued to carry on the spirit of the early inventors. This program bore fruit and continues to produce results that make it appear that one day men will conquer outer space.

Among the developments of the late 40s were jet planes that spanned the continent in four hours and thirteen minutes in 1945. In the same year the first jet-propelled bomber took to the air. The Consolidated-Vultee B-36, superbomber which would permit the Strategic Air Command to strike any target in the world from bases in this country, was unveiled. On 4 October 1945 the Air Force made one of history's significant flights—a 9444 mile nonstop trip from Hawaii to Cairo via the North Pole in the B-29 *Pacusan Dreamboat.* On 8 December 1945 the Bell XS-1, first rocket-propelled airplane of the Army Air Forces, stayed aloft for almost twenty minutes. A year later it was to be revealed that it had exceeded the speed of sound. Another mark was set on 28 February 1947 when two pilots flew a North American P-82 Mustang twin-fuselage fighter 5000 miles from Honolulu to New York in fourteen hours and thirty-three minutes. On 17 March in the same year the North American B-45, a four-jet bomber, made its first test flight and in May the B-50, a new and much-improved version of the B-29, added to the Army Air Forces' striking range.

A far cry from the day when Wilbur Wright could run alongside his brother's plane, this B-47 utilizes a brake-chute to slow down on landing.
U. S. Air Force Photograph

In August 1947, the Army Air Forces had more than 300,000 officers and men, with 25,000 aircraft, about 10,000 of which were first-line. Six weeks later, on 18 September 1947, as a result of the reorganization effected by the National Security Act of that year, the United States Air Force came into being. Now the Air Force was a member of the three team National Defense Establishment, later to be organized as the Department of Defense.

Still the fruits of research and development in various fields continued to ripen. On 22 September 1947 a "push-button" Douglas C-54 Skymaster made an automatic crossing of the Atlantic and two weeks later the same plane, its controls untouched by human hands, crossed back. A report of polar study proved that there were three Magnetic North Poles, where previously only one had been thought to exist.

Despite continued economy, the Air Force laid great stress on increasing its capacity for combat. It especially concentrated on the combat readiness of its strategic air forces as a deterrent to attack. It also advanced a joint program of training with the other military services.

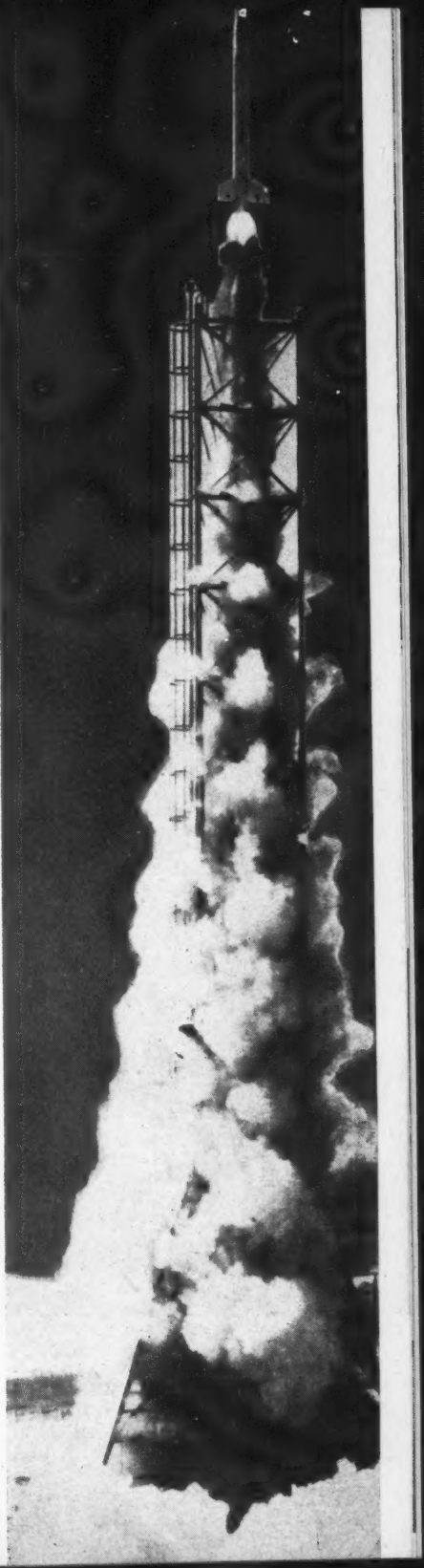
At the time war erupted in Korea in June 1950, the Air Force had 48 groups. (The Army and Air Force Authorization Act of 1949 had given statutory authority for a 70 group Air Force, but funds were not made available.) For the first time jets were tested under combat conditions in Korea. On 1 November 1950 a Russian-built MIG-15 jet fighter was sighted and on 8 November the first jet plane aerial combat in history took place when an F-80 shot down a MIG-15.

In September 1950 personnel ceilings were suspended and the Air Force set about rebuilding its strength. At the same time, Air Research and Development Command was established to further emphasize qualitative improvement. (See "Military Aviation—Research for the Future," page 41.)

Meanwhile in the skies over Korea, American jet fighters were proving the value of research and development. Equipped with radar aiming devices and other items of equipment, they established by the end of 1951 an eight to one ratio of kills over the Russian-built MIGs. That ratio was later increased to twelve to one. Jet bombers also appeared for the first time in combat. In 1952 the Air Force ordered production of two supersonic fighters, the Delta wing F-102 Convair and North American F-100. At the same time gigantic eight-engine bombers were making their first flights.

The Korean War brought the versatile helicopter into prominence. Although long known in principle, the rotor-bladed machine had not been widely used until its special qualities created a demand for it in Korea. Able to take off almost vertically and to land in a small space or even to hover in the air, it has proved invaluable in bringing out wounded from otherwise inaccessible places.

While these developments have been under way, all phases of science that can contribute to the field of aviation are being explored. New types of airplanes are certain to result. Today all services are conducting research in the field of pilotless planes or missiles of one type or another. It does not seem far-fetched to say that man's dream of conquering outer space may not be far from realization, at least no further than man's aspirations to perfect heavier than air flight in the days when the Wright brothers were making their first experiments.



Upper air research is conducted with this Aerobee rocket, carrying instruments to record physical properties and phenomena of the upper atmosphere.

U. S. Air Force Photograph

New aircraft must prove their air-worthiness before being adopted for combat use. Here a B-47 takes off at the Flight Test Center at Edwards Air Force Base, California.

U. S. Air Force Photograph

MILITARY AVIATION--
RESEARCH FOR THE FUTURE

LIEUTENANT GENERAL EARLE E. PARTRIDGE

AS MAN has groped his way toward betterment of his physical welfare, his advances have depended largely on the quality of the tools he has developed. The basic instruments of lever, wedge, screw and inclined plane have been combined into ever more complicated machinery. Similarly the slow and halting advances of far-off times have given way to rapidly accelerating progress that allows man to raise his standards as he delves into the mysteries of the universe and reaches out to conquer space.

To accomplish these advances—especially those that have come about in the past half century—man has continually developed new applications of science, engineering, materials, and equipment. Industry spends millions yearly on research and development to help produce them. Militarily the tempo also has increased until today the nation which stints on research and development finds itself lagging in this race. And to lag may well mean disaster.

As far as the United States Air Force is concerned, it is realized that our combat airmen, however skillful and courageous, will fight in vain unless they are provided with the most effective weapons, aircraft and equipment—their tools. Their margin for probable success can be widened only by continuous advancement in science and technology. Giving force and direction to this effort, the Air Force has established the Air Research and Development Command (ARDC) to provide quality instruments that will assure the world's best air force.

Specifically these quality tools mean aircraft, materials, fuel, weapons and techniques. Air Research and Development Command is responsible for continually improving those in use today and, what is even more important, for providing newer and better equipment for tomorrow.

To achieve these vast twin objectives, ARDC sponsors develop-

LIEUTENANT GENERAL EARLE E. PARTRIDGE, USAF, formerly Commanding General, Air Research and Development Command, is now Deputy Chief of Staff, Operations, Headquarters, United States Air Force.

ment of new and improved devices and systems for the conduct and support of aerial warfare, including piloted and pilotless aircraft, weapons, electronics equipment and entire weapons systems. It also sponsors a broad program of scientific research.

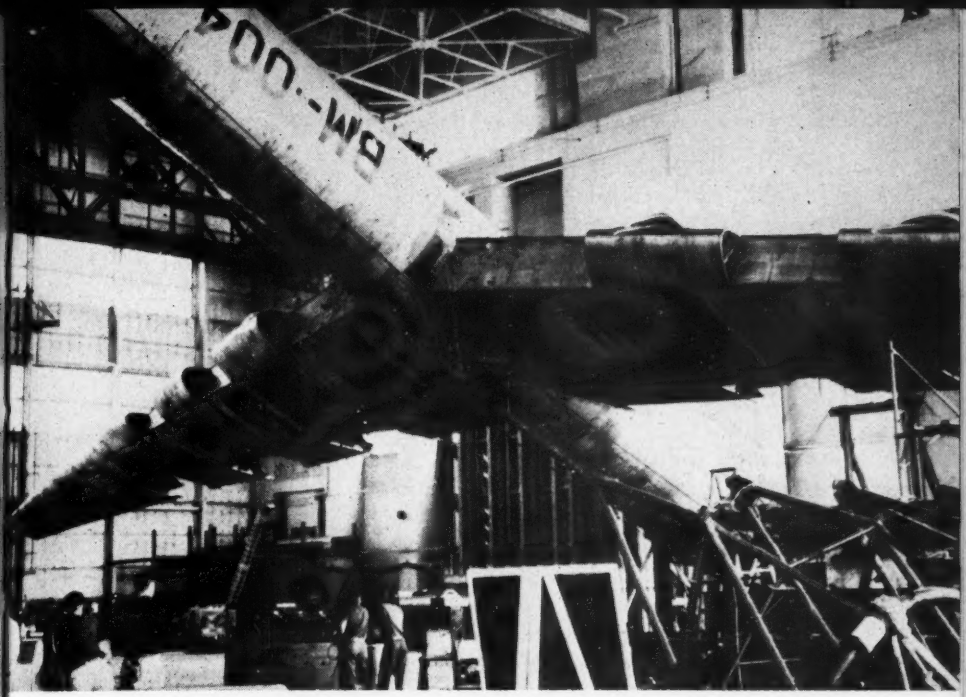
Most of this work must be performed by the Nation's industry whose competitive design teams, production experience and scientists are the foundations of our air power. In the field of basic research, ARDC relies heavily on, and works closely with, university laboratories, independent research organizations and the National Advisory Committee for Aeronautics. Also, many important portions of the entire program are performed in ARDC's own unique facilities.

From headquarters of the Command at Baltimore, Maryland, ARDC directs operations at nine major Air Force research, development and testing centers. Investigations range through the sciences, engineering fields, medicine, social studies and other areas of scientific inquiry. With the advances made in aviation since World War I, there is almost no subject that is not vitally important in supplying better equipment for our airmen. Anything that contributes to the task of overcoming the hazards to man in the air becomes of interest to ARDC.

Although the Command's program has the single purpose of national defense in mind, many other results accrue. Over the years the whole peacetime economy of the country is bound to benefit. Materials and techniques developed for purely military purposes fan out to commercial aviation and into many other industries as well. The ultimate significance of basic research can seldom be predicted; but it certainly and inevitably leads to a multitude of other—and often unexpected—applications.

Established as a major command only two years ago, ARDC supervises and co-ordinates activities of the various Centers with over-all research and development objectives of the Air Force. At Command Headquarters, two staff agencies have the main responsibility for research and development while the other staff agencies provide them with the required support. The Office of Scientific Research concentrates on basic projects while the Office of the Deputy for Development implements the systems approach to Air Force development activities.

As the name implies, the Office of Scientific Research accomplishes basic research projects in such fields as chemistry, fluid mechanics, mathematics, solid state sciences (temperatures) and physics. This Office surveys, contracts for and monitors research in these areas. Some of the work is performed by the



Scientists at Wright Air Development Center apply weights on an inverted B-36 fuselage to determine its structural qualities. U. S. Air Force Photograph

Centers but most is allocated under contract to universities, industrial research laboratories, research foundations and other non-profit organizations. (See "University Research for Defense," June 1950 DIGEST.) In the field of chemistry, studies are made in production of energy by chemical changes; in fluid mechanics, turbulence and compressibility effects of liquids are analyzed. High-speed computing devices come within the scope of mathematics while in the field of physics, magnetics and atomic structure are studied.

The Office of the Deputy for Development implements the "systems approach" to United States Air Force development activities. This is in itself a comprehensive concept that involves not simply the study or development of one weapon or engine or aircraft—but the entire "system." It insures the development, therefore, of all the various parts or elements required to fulfill an over-all Air Force requirement. Thus the approach to air defense systems, for example, ties together all related activities of the Command to make available by a certain date a required air defense system. This may mean not only an aircraft with all its allied equipment, but also the ground equipment essential for this particular craft to accomplish its desired mission. (See "Air Weapons Development Systems," August 1953 DIGEST.)

In addition to air defense, four other "systems" directorates come under the Deputy for Development—strategic combat, tactical combat, reconnaissance and intelligence, and air logistics. In order to provide the vastly intricate parts needed for "systems" support, seven "technical" directorates are maintained—Human Factors, Equipment, Aeronautics and Propulsion, Armament, Electronics, Geophysics, and Nuclear Applications.

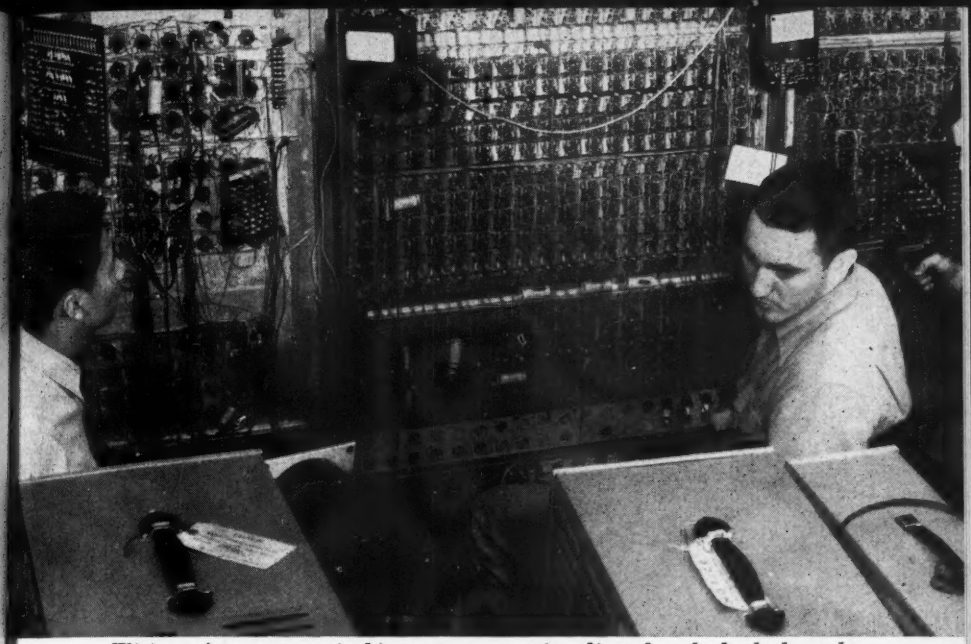
Each directorate works closely with the Centers whose responsibilities come within its sphere of activity The Geophysics Directorate, for instance, performs much of its work in close association with the Air Force Cambridge Research Center in support of atmospheric studies designed to increase understanding of the problems of high altitude flight.

Air Research and Development Command maintains close and constant communication with the Air Force's major combat commands. This insures that Air Force requirements are accomplished on time and effectively. Handling this function is the Office of Operational Readiness whose personnel spend more time in the field than at headquarters working mainly with the major operational commands. Currently a special field liaison office is attached to the Far East Air Forces to keep a close watch on lessons coming out of Korea which may serve as a guide to future research and development. This office also assists the fighting commands in solving any problems encountered in the use of newly developed weapons or equipment.

The activities of the Air Research and Development Command are carried out in close co-ordination with the research and development activities of the Air Force's sister services. This insures that the Nation achieves its long-range military research and development objectives with the least possible expenditure of funds, personnel and natural resources.

In order to understand the scope and variety of operations supervised by the Air Research and Development Command, it is necessary to survey the range of activities at each Center:

Wright Air Development Center. One of the most extensive and completely equipped facilities in the world for research and development in the aeronautical sciences, the Center at Wright-Patterson Air Force Base, Dayton, Ohio, carries on programs embracing all aspects of aircraft and missiles, power plants, propellers, armament, airborne and ground equipment and other aeronautical materiel. The Center conceives and monitors a broad program of research and development by industry, universities and research institutions.

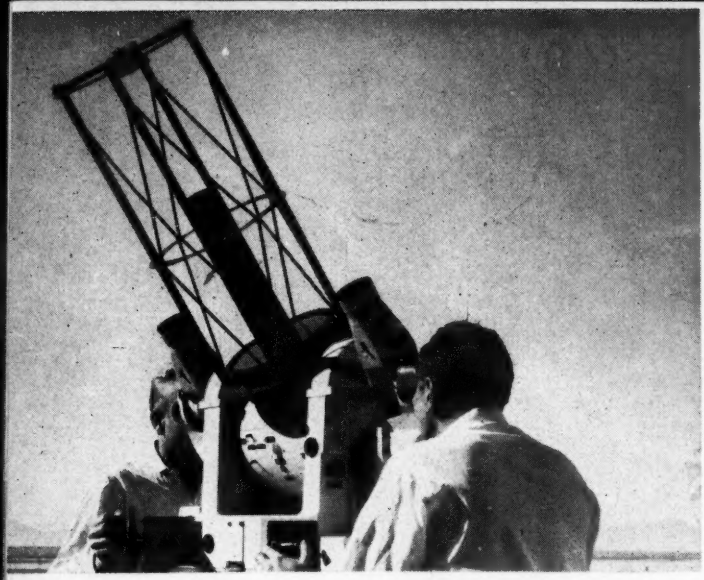


Wiring of an automatic binary computer is adjusted and checked at the Air Force Cambridge Research Center. U. S. Air Force Photograph

At the Center itself are thirteen laboratories and a Directorate of Flight and All-Weather Testing. The Communication and Navigation Laboratory works on navigation and traffic control systems, communication systems, automatic ground position indicators, antennae for high-speed aircraft and long-range communications equipment. The Aircraft Radiation Laboratory concentrates on radar and telemetering guidance devices, jamming system studies for pilotless aircraft and radar techniques for airborne fire control, radomes and television equipment for drone aircraft. The Electronics Components Laboratory handles installation engineering for airborne electronic equipment and other projects.

The other laboratories, whose activities are described by their names, are the Aircraft, Equipment, Armament, Power Plant, Propeller, Materials, Photographic Reconnaissance, Experimental Fabrication, Aeronautical Research and Aero Medical. The latter seeks to improve the effectiveness of the human operator by minimizing hazards of the combat situation and extremes of the physical environment to which he is exposed. Specialists in many of the biological sciences work here. (See "Air Research for Survival," November 1950 DIGEST.)

The Directorate of Flight and All-Weather Testing aids in developing components and establishing design criteria through flight testing. It also develops and evaluates equipment and techniques to facilitate air operations under all conditions of weather and visibility.



Rockets flashing through the upper air are tracked electronically by this device at Holloman Air Development Center.
U. S. Air Force Photograph

Air Force Cambridge Research Center. This Center, at Cambridge, Massachusetts, is the focal point of a broad program of fundamental and applied research in electronics, geophysics, radiochemistry and radiology designed to establish basic principles in all of these fields and to advance specifically their military applications.

Much of the Center's work is devoted to improving the electronic systems and instruments that serve as eyes and ears of the Air Force. With the great speeds developed by jet aircraft today, it is virtually impossible to aim a jet fighter's gun effectively unless complicated electronic devices are employed. All of this calls for research on electronically steerable antennae for long-range radar, on airborne radar antennae for sonic and supersonic aircraft and missiles and on lens and rapid scan antennae. Fundamental studies are also made on radiating structures. Other studies are concerned with transformation of energy into signals, transmission of such signals and their reconversion into useful forms with optimum efficiency and readability. Development of air defense systems also is emphasized.

Geophysical research consists of theoretical and experimental investigations of the physical phenomena encountered in, resulting from, or influenced by the earth, its air and oceans.

The Center's basic research in radiochemistry and nuclear physics is designed to provide the Air Force with essential facts covering the biological and medical aspects of nuclear weapons. Additional information will result in improved techniques and equipment for prevention and treatment of nuclear weapons casualties. This is one field where purely military research has direct implications for the civilian population as well.

Rome Air Development Center. Ground-based electronic equipment is the main subject under study at Rome Air Development Center at Griffiss Air Force Base, Rome, New York. Here electronic equipment is tested under field conditions, field test equipment is designed and developed, and flying laboratories are provided for equipment testing and evaluation. Principal test units include six laboratories—Radar, Navigation, Communications, Materials Testing, General Engineering and Test Facilities.

Under development is a completely automatic reporting system for utilizing electronic data for identification, charting and interception of enemy aircraft and missiles. Here also is maintained a general engineering service for the Air Force, its authorized contractors and governmental agencies.

The Center supervises reconnaissance systems developments. A two million dollar laboratory, now under construction, will furnish improved facilities for studies in aerial reconnaissance, photography, weather and electronics.

Air Force Flight Test Center. This primary testing base for transonic and supersonic aircraft is located at Edwards Air Force Base, California, on 183,000 acres of open Mohave desert including the famous dry lake bed commonly known as Muroc Lake. It was here that the first faster-than-sound flight was made in 1947 in the Bell X-1 research aircraft.

Here new aircraft are tested for air worthiness, equipment functioning, design refinement, performance and stability. Tests

Major Charles Yeager, test pilot who first broke through the sound barrier, prepares to test a delta-wing design plane at the Flight Test Center.
U. S. Air Force Photograph

are conducted on power plants, armament and fire control systems, and other components. High-speed, high-altitude bomb drop tests also are carried out.

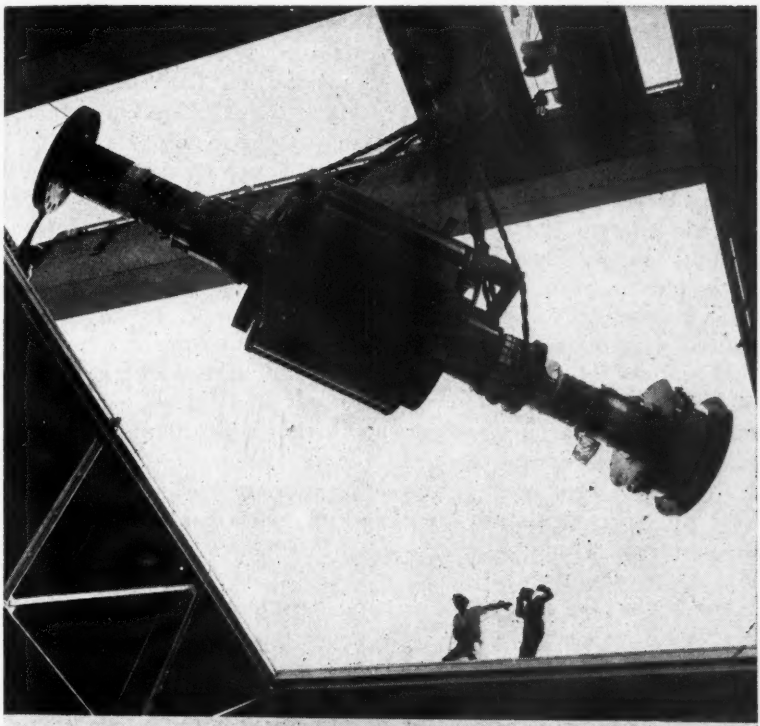
Adjacent to the Flight Test Facility is a rocket engine static test stand used in testing engines for aircraft and assist take-off units. At the Research Tracks Facility, studies are conducted on the operational characteristics of aircraft under controlled deceleration and velocity. The human factors of deceleration, including escape and safety features, also are tested here.

Air Force Missile Test Center. Stretching a thousand nautical miles from Patrick Air Force Base, Coca, Florida, over the South Atlantic Ocean to the Caribbean Sea, is the world's longest proving ground for pilotless aircraft and rockets. The site comprises about a hundred thousand square miles of testing range; if necessary it could be extended more than half way around the world without ever crossing a major populated land area.

Here improved rockets and aircraft like the new pilotless bomber, the Matador, are exhaustively flight-tested. These are traced by a chain radar system responding to a radar beacon in the aircraft; by a series of base line triangulation systems augmenting single station precision radar systems; and by optical instruments such as phototheodolites, tracking telescopes and high-speed cameras. Information on performance is recorded by instruments in the aircraft themselves. Data is telemetered to a surface receiving station and is then transmitted to the Center where it is edited, correlated and analyzed by analogue devices and digital computers. A comprehensive weather service is maintained to indicate proper testing conditions. Every precaution is taken against danger; the range must be kept clear of vessels and other aircraft and, if necessary, the test aircraft itself can be destroyed by an explosive charge while in flight.

Holloman Air Development Center. Investigations into guided and ballistic missiles, guided bombs and target aircraft are made by the Center at Holloman Air Force Base near Alamogordo, New Mexico, which is part of the joint Army-Navy-Air Force White Sands Proving Ground. On a 38x64 mile range, tests are made on surface-to-air supersonic missiles which are remotely controlled for intercepting hostile aircraft, on high-angle controllable bombs and also on subsonic surface-to-surface pilotless aircraft.

Still another function here is the development and operation of instruments and systems to provide precise, co-ordinated data



The rotor of the world's most powerful electric motor is installed in the wind tunnel at Arnold Engineering Development Center. U. S. Air Force Photograph

on launching, flight and impact performances of experimental pilotless aircraft.

The installation also is a test site for electronics and upper atmospheric research under direction of other ARDC Centers. Some of these include studies of radio wave propagation at high frequencies, investigation of the electrical characteristics of the ionosphere and composition and acoustical properties of the upper atmosphere. Studies also are made of high altitude winds; biological effects of cosmic radiation and reduced gravity; and intensity of radiation from the sun, nocturnal space and from the earth. Such data is useful in preparing design criteria for development of missiles, aircraft and associated equipment.

Air Force Armament Center. Despite the advent of atomic bombs, higher and faster flying aircraft and guided missiles,

conventional armament still plays a tremendous part in operation of our aircraft. Development testing of such weapons and armament equipment is conducted at the Air Force Armament Center, located within the reservation of the Air Proving Ground Command at Eglin Air Force Base, Valpariso, Florida.

Such items as rockets and machine guns, accurately guided to the target by electronic fire control systems, still are needed to gain control of the air and also to lend close support to ground troops. Newer all-weather bombing systems are being perfected to pinpoint the target—with either conventional or atomic bombs. Precision testing of such weapons and their fire control systems is carried out over highly instrumented ranges.

Proximity of the Air Proving Ground allows use of much of that facility's equipment. The Gulf of Mexico provides a large over-water range; together with adjoining land areas, the surroundings are well designed for precision work on difficult and complex armament systems. The Center works closely with both the Army Ordnance Corps and the Chemical Corps through detachments which it maintains at Aberdeen Proving Ground and Edgewood Arsenal.

Air Force Special Weapons Center. Originating from a nucleus of Air Force scientists and technicians who participated in the Hiroshima and Nagasaki bombing operations and the Bikini nuclear tests, the Special Weapons Center today maintains facilities for Air Force participation in atomic studies at Kirtland Air Force Base, Albuquerque, New Mexico.

The Center assists the Atomic Energy Commission in developmental testing of atomic weapons and provides similar support to other agencies of the Armed Forces. During periodic nuclear test operations at the Nevada Proving Ground and at Eniwetok in the Pacific, extensive field and air support is given to the Commission. This close relationship provides the Air Force with the capability of utilizing "ultimate weapons" at the earliest practicable date.

Arnold Engineering Development Center. This Center, now under construction near Tullahoma, Tennessee, was dedicated in 1951 in honor of the late General of the Air Force H. H. Arnold. When completed it will provide facilities for test and evaluation of supersonic aircraft and aircraft engines of all types for the Air Force. An Engine Test Facility, a Gas Dynamics Facility and a Propulsion Wind Tunnel will be supplemented by all necessary supporting services and utilities.

In the past few months the human resources research activi-

ties of the Air Force have been integrated into the Air Research and Development Command. Now operating as units of ARDC are the Human Resources Research Institute, Maxwell Air Force Base, Montgomery, Alabama; the Human Resources Research Center, Lackland Air Force Base, San Antonio, Texas; and the Human Factors Operations Research Laboratories, Bolling Air Force Base, Washington, D. C.

Originally established in 1949 to conduct research in the human resources problems of the Air Force and to help the Air Force make use of social science research in general, the Human Resources Research Institute conducts research in psychological warfare, strategic intelligence, officer personnel, officer education, manpower and human relations. The Human Resources Research Center conducts research in selection, classification, training and proficiency as they affect manpower resources available to the Air Force. This includes flying training methods, technical training, basic military training, officer candidate training, perceptual and motor skills, proficiency, selection and classification, and vocational aptitude. The Human Factors Operations Research Laboratories are concerned with the development of improved devices and techniques for making man a more efficient and less expensive component of air weapons systems. The Laboratories conduct research on personnel problems in the operational commands, human operator and language variables as they affect communications, human factor principles for the design and development of all types of communications equipment, and principles underlying the development and utilization of mass training aids.

All of these variegated yet interrelated activities merely suggest the vastness of the work carried on by the Air Research and Development Command. Daily thousands of scientists and airmen labor at delicate instruments, in laboratories, in broiling sun, at sea and high in the air to test new tools that will enable the United States Air Force to maintain its superiority. Daily the Command operates with the incentive of knowing that Air Force personnel depend upon it for top quality tools which will enable them to continue providing this Nation with security for the future in the form of the world's best air force.

KOREAN MILESTONES 1950-53

CAPTAIN ROBERT J. LOESCH

THE KOREAN WAR—which began at 0400 on Sunday morning 25 June 1950 when Communist-trained armies of North Korea launched their shattering assault on "The Land of the Morning Calm"— produced some significant "firsts" in United States Army history.

During the three years of fighting and intermittent peace negotiations, nearly half a million American soldiers have served in Korea and have since been transferred out—including those rotated to the United States, medical evacuees, units moved to Japan and other areas, and individuals discharged from the Army. As a result, three Eighth Armies have fought in Korea—the original one, units of which first entered the war in July 1950; another which began to replace the first in April 1951; and the Army which is there today.

Another monumental first is the fact that the United States and twenty-one other nations have joined under the United Nations flag to repel Communist aggression. For the first time in modern history, an assembly of states marshalled a truly international fighting force to resist an aggressor nation. Action was initiated promptly after the Russian-trained Communist Army of North Korea crossed the 38th Parallel to invade the Republic of Korea. The United States Government brought the aggression to the attention of the United Nations Security Council. On the afternoon of 25 June, the Security Council called upon the North Korean authorities to withdraw their armed forces and asked all United Nations members to refrain from giving assistance to the North Koreans. Then, on 27 June, the Security Council recommended that United Nations members act to repel the armed attack and restore peace and security in Korea.

Following are the significant events that ensued:

CAPTAIN ROBERT J. LOESCH, Artillery, is a staff member of Feature Branch, Public Information Division, Department of the Army.

1950

27 June—President Truman orders United States air and naval forces to help repel North Korean invaders.

28 June—Seoul, Korean capital, abandoned to invaders.

30 June—President Truman authorizes General Douglas MacArthur to send ground forces to Korea.

1 July—First U. S. Army combat unit lands in Korea.

5 July—U. S. Army troops fight first engagement in Korea.

7 July United Nations Security Council authorizes use of U. N. flag in Korea.

8 July—General MacArthur named Commander in Chief, United Nations Command.

10 July—U. S. tanks in first action; first Red atrocities reported.

12 July—U. S. troops fall back across Kum River near Taejon; Lieutenant General Walton H. Walker takes command of all U. S. forces in Korea.

18 July—U. S. reinforcements land in Korea.

20 July—Taejon lost to enemy; Major General William F. Dean reported missing.

24 July—Reds in western Korea push to southern coast and attack toward Pusan.

31 July—First reinforcements land direct from United States.

3 August—U. S. troops fall back to Naktong River line; Reds thrust to within forty miles of Pusan.

7 August—U. S. forces launch strong counter-offensive toward Chinju, west of Pusan.

29 August—First British troops arrive from Hong Kong.

1 September—Reds establish seventeen bridgeheads across Naktong River and push to within thirty miles of Pusan.

7 September—Reds reported seven miles from Taegu.

14 September—Red drive on Taegu stalled.

15 September—U. N. invasion fleet lands at Inchon.

16 September—After six weeks behind Pusan perimeter, Eighth Army jumps off in all-out offensive.

26 September—Seoul liberated by X Corps; Eighth Army Task Force links up with Inchon invasion south of Suwon.

30 September—U. N. forces regain nearly all territory south of 37th Parallel.

1 October—ROK Third Division pushes across 38th Parallel and speeds up east coast.

9 October—U. S. 1st Cavalry Division crosses 38th Parallel.

10 October—ROK Capitol and Third Divisions capture port of Wonsan.

19 October—Pyongyang, North Korean capital, taken.

20 October—U. S. 187th Parachute Infantry Regimental Combat Team jumps at Sukchon and Sunchon, twenty-five miles north of Pyongyang.

26 October—ROK Sixth Division reaches Yalu River at Chosan; U. N. forces capture first Chinese Communist soldiers.

1 November—U. N. pilots opposed for first time by speedy Russian-built MIG-15 jet fighters.

2 November—1st Cavalry Division (Infantry) suffers severe casualties when hit by Chinese Communists at Unsan.

21 November—U. S. 7th Infantry Division occupies Hyesanjin on banks of Yalu.

24 November—U. N. forces launch "end-of-war" offensive; ROK troops enter Chongjin, sixty miles from Siberian border.

25 November—Communists launch violent counter-offensive, forcing U. N. troops to begin withdrawal.

27 November—U. S. Army and Marine units attacked by six Chinese divisions in the Chosin Reservoir area.

5 December—U. N. forces abandon North Korean capital.

9 December—Special relief force makes contact with U. S. Marines cut off in Chosin Reservoir area.

11 December—U. N. forces begin evacuation of Hungnam, Songjin and Wonsan.

23 December—General Walker killed in jeep accident.

24 December—Last of 105,000 troops evacuated from Hungnam beachhead safely aboard ship.

26 December—Lieutenant General Matthew B. Ridgway arrives to take command of all U. N. ground forces in Korea.

1951

1 January—Communists launch general offensive.

3 January—Seoul abandoned for second time by U. N. forces.

7 January—Communist forces attack Wonju.

25 January—U. N. re-takes offensive to wage war of maneuver.

5 February—"Operation Round-up" launched against North Korean Second and Fifth Corps.

13 February—U. S. 2d Division's 23d Infantry and attached French Battalion surrounded by three Chinese Communist Divisions at Chipyong-ni.

21 February—"Operation Killer" launched to annihilate enemy forces and re-establish U. N. line east of Wonju.

7 March—"Operation Ripper" launched to outflank Seoul and capture Chunchon.

United States Eighth Army Units in the Korean War

Location of units is as of 25 June 1953.

During the Korean War, the following major units of the Eighth Army played a prominent role in the fighting:

24th Infantry Division—First United States division to enter the fight against Communist aggressors, this unit entered Korea from Japan between 2 and 6 July. The division fought on until 4 February 1952 when it was ordered back to Japan.

1st Cavalry Division (Infantry)—After serving in Korea from 18 July 1950 to 30 December 1951, the 1st Cavalry Division returned to Japan.

25th Infantry Division—Entered Korea 9 to 18 July 1950 and is still engaged there.

2nd Infantry Division—Landing in Korea on 30 July 1950, this unit was still serving in Korea on the war's third anniversary.

5th Regimental Combat Team—This unit from Hawaii has been serving in Korea since 3 August 1950.

1st Marine Division—An advance component (1st Provisional Marine Brigade) reached Pusan early in August 1950, and later was withdrawn to Japan. The 1st Marine Division was formed in Japan and landed at Inchon on 15 September 1950. It is still involved in Korea.

187th Regimental Combat Team—Entering Korea 17 September 1950, this unit left the war zone on two occasions during the next two years and finally returned to Japan on 17 October 1952.

7th Infantry Division—Entering Korea 18 September 1950, this unit is still involved there.

3rd Infantry Division—Landed in Korea 12 November 1950 and is still serving there.

45th Infantry Division—Arriving in Korea 5 December 1951, this division is still on duty in Korea.

40th Infantry Division—This division arrived in Korea on 11 January 1952 and is still serving in Korea.

15 March—Seoul re-taken by U. N. forces.

23 March—U. S. 187th Regimental Combat Team jumps at Munsan in attempt to cut off enemy forces south of Han River.

11 April—General MacArthur relieved of all his commands in Far East by President Truman.

12 April—General Ridgway becomes Supreme Commander of Allied Powers and General James A. Van Fleet assumes command of U. N. forces in Korea.

22 April—Reds launch spring counter-offensive with estimated 600,000 troops.

29 April—Red counter-offensive comes to abrupt halt after carrying to outskirts of Seoul in west, and forty miles south of 38th Parallel in central Korea.

3 May—U. N. forces launch a limited objective attack to regain former positions and re-establish contact with enemy.

16 May—Enemy launches second spring offensive with approximately twenty-one divisions across seventy-five mile front.

19 May—U. N. forces halt enemy drive on western front and launch savage counter-attack.

21 May—U. N. forces halt enemy drive on eastern front and counter-attack.

24 June—Jacob Malik, Soviet's U. N. representative, advocates cease-fire in radio speech.

30 June—General Ridgway proposes meeting to discuss armistice; suggests Danish hospital ship in Wonsan harbor as site.

1 July—Red commanders propose meeting be held at Kaesong on 38th Parallel.

10 July—First meeting between U. N. and North Korean-Chinese delegations held at Kaesong.

26 July—After tenth meeting, two delegations announced agreement on five-point order of business.

15 August—Far East Air Forces start "Operation Strangle."

23 August—Communists suspend armistice negotiations.

13 September—U. N. begins attack on Heartbreak Ridge.

25 October—Armistice talks resumed as delegates meet for twenty-seventh plenary session.

27 November—Plenary session agenda item number two—military demarcation line—ratified by both sides.

2 December—Task Force Paik launches "Operation Rat-Killer" against guerrillas in Chirisan Mountain area.

18 December—Both sides exchange prisoner lists. U. N. held 132,474 Red prisoners. Communist list contains 11,559 names.

1952

24 January—Korean truce negotiations stalemated.

16 February—U. S. warships start second year of shelling and blockade of Wonsan.

20 March—Agreement on "ports of entry" through which men and supplies would move to and from Korea during truce reached by U. N. and Communist delegates.

7 May—Brigadier General Francis T. Dodd, commander of U. N. Prisoner of War Camp Number One on Koje-do, is seized and held for seventy-eight hours by Communist prisoners.

12 May—General Mark W. Clark takes over from General Ridgway as Supreme Commander.

19 June—"Operation Break-up"—resettlement of Koje Island prisoners in 500-inmate stockades completed.

United Nations Allies in the Korean War

Since the outbreak of fighting in Korea, twenty-two nations have joined forces under the United Nations flag to resist Communist aggression.

Initially, United States Army troops were committed piece-meal to bolster the Republic of Korea defenders. By August 1950, four United States infantry divisions, two regimental combat teams and the First Provisional Marine Brigade were in action.

The first foreign contingent to join the United States and the Republic of Korea in combatting aggression on the ground was the 27th British Brigade from Hong Kong. These British soldiers entered Korea on 29 August 1950.

Other initial United Nations' ground force contingents and their dates of arrival in Korea follow:

Philippine Combat Team—19 September 1950
Royal Australian Rifles—28 September 1950
Turkish Infantry Brigade—17 October 1950
Thailand Regimental Combat Team—7 November 1950
Netherlands Battalion—23 November 1950
French Battalion—28 November 1950
Greek Battalion—8 December 1950
Canadian Light Infantry—18 December 1950
New Zealand Artillery Battalion—2 January 1951
Belgium-Luxembourg Battalion—31 January 1951
Ethiopian Battalion—5 May 1951
Colombian Battalion—15 June 1951

In addition to the combined effort on the ground, flying contingents from Australia and the Union of South Africa joined United States and Republic of Korea Air Force units.

At sea, combat units from Australia, Canada, Colombia, the Netherland, New Zealand, Thailand, and the United Kingdom combined their efforts to assist United States and Republic of Korea naval units.

Medical supporting elements from Denmark, India, Italy, Norway and Sweden also joined the United Nations effort in Korea.

23 June—Large-scale U. N. air attack knocks out 90 per cent of North Korea's power supply.

10 July—Korean truce talks enter second year.

4 September—Air Force reports record one-day bag of thirteen Red MIGs.

6 October—Estimated 10,000 to 15,000 enemy troops launch largest Red attack of year.

8 October—Truce teams agree to indefinite recess.

15 October—Large U. S. amphibious force fakes invasion and conducts "training exercise" off northeast Korea below Wonsan.

1953

25 January—"Operation Smack" starts on west-central front.

11 February—General Van Fleet turns over command of Eighth Army to Lieutenant General Maxwell D. Taylor.

6 April—U. N. and Reds open talks on exchange of sick and wounded prisoners.

11 April—Agreement reached on prisoner exchange—605 U. N. troops for 6030 Reds.

26 April—Communists completed return of 684 sick and injured U. N. prisoners. The exchange consisted of 471 South Koreans, 149 Americans, 32 Britons, 15 Turks, 6 Colombians, 5 Australians, 2 Canadians, 1 Netherlander, 1 Filipino, 1 South African and 1 Greek.

3 May—First round of sick and wounded exchange completed in Panmunjon when U. N. finished turning back 5194 North Korean, 1030 Chinese soldiers and 446 North Korean civilians.

7 May—Red negotiators concede that war prisoners unwilling to return to Communist control may be placed in neutral custody.

14 May—Deadlock develops in truce negotiations over plans for handling prisoners who object to returning to North Korea.

16 May—Truce talks recessed.

24 May—Allied warships enter Wonsan harbor, bombard port.

25 May—A new U. N. armistice plan on prisoners of war submitted to Reds.

27 May—U. S. 5th Air Force reports 51 Red MIG-15 jets downed since 1 May at cost of only one U. S. Sabre jet.

30 May—Communist troops attack in strongest action since October.

8 June—U. N. and Red delegates sign an agreement on prisoners of war. Vigorous opposition voiced by President Syngman Rhee and South Korean government.

11 June—Attacks by Chinese Reds renewed.

18 June—South Koreans release 25,000 North Korean anti-Red prisoners of war rather than turn them over to a custodial commission as specified in the proposed truce agreement.

12 June—Heavy Red attacks on central and eastern fronts.

20 June—Truce negotiations suspended.

25 June—Communist troops attack ROK positions on east-central front. Anti-armistice demonstrations staged in Seoul by South Koreans.

30 June—Sabre jets score biggest one-day kill of the war by shooting down fifteen MIG-15s over North Korea.

13 July—Chinese Reds open major attack, driving South Korean units from sixty square mile area to flatten out the U.N.'s Kumsong River bulge.

16 July—U.N. troops begin counterattack on east-central front in Kumhwa-Kumsong area. Red truce delegates request a recess after being warned either to sign an armistice soon or break off the talks.

27 July—Armistice agreement signed at Panmunjom.

Communists Fail in Six Major Offensives

During the first year of conflict in Korea, Chinese and North Korean Communist armies launched six major offensives to destroy United Nations and Republic of Korea forces or drive them off the peninsula:

25 June 1950—Russian-trained North Korean Army attacked across the 38th Parallel.

28 November 1950—Chinese Communist forces struck in strength in Chongchon River sector.

31 December 1950—Enemy forces began a drive which carried them south of the 38th Parallel.

11 February 1951—Communist troops attacked in Wonju area.

22 April 1951—Communists began first spring offensive with a general assault across Imjin River and in area north of Inje.

16 May 1951—Enemy launched a second spring offensive.

All six of these major attacks failed. In every instance the Communists suffered heavy losses at the hands of United Nations forces.

FROM FRONT LINES TO HEADLINES

MAJOR WALTER A. PENNINO

THERE WAS A TIME, not long ago, when many Eighth Army soldiers were beginning to consider themselves forgotten men, their individual activities almost unknown to their neighbors back home. Yet public information officers trying to get recognition for them in their home town newspapers could only hope to scratch the surface because they lacked facilities and personnel to cover all the men who deserved mention. Those public information officers who concentrated on volume of coverage frequently spread their efforts too thinly. The result was sketchy, incomplete, sub-standard copy. Thus, while editors were crying for home town news material it was difficult to provide as much usable copy as they wanted.

Today, however, thousands of home town releases are getting into print, the editors and the reading public are happy, and the individual soldier has the satisfaction of knowing that the folks at home are following his career with interest. All this is the result of the Army's Home Town News Center in Kansas City, Missouri. Established in July 1951, it acts as a clearing house for all home town news and feature stories from the field.

Before its inception, unit public information offices mailed material directly to any media at any time they chose. Such a system had weaknesses. A public information office at Fort Dix, New Jersey, and another at Fort Ord, California, for example, might send material to the same editor on the very day he was flooded with dozens of other Army releases. The result was often a disgusted editor. To eliminate just such a reaction, the Army Home Town News Center was given the authority under AR 360-20 to "improve, supervise, and control the flow of informational material to home town news media."

The Center's chief product is an expanded version of the personal news story commonly used in many newspapers. Since

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about 85 percent of the daily and weekly publications use this type of story, it is an effective way to create public understanding and support and boost troop morale. Nothing contributes more to the average soldier's *esprit.* President Eisenhower, when he was Supreme Commander in Europe, summed it up by saying, "I know of nothing which so improves a soldier's morale as to see his unit or his own name in print just once."

Good home town stories are practically unlimited. They are pegged on individual accomplishments in training or combat, awards and decorations, arms qualifications, promotions and athletic feats. Even the most commonplace military event makes good home town copy. When Private Joe Doe reports to a division overseas, his arrival may seem quite routine. But back in Plainsville where he went to school, it is news and will be gladly treated as such by the local editor.

From wide experience with all types of media, the Center has established standard procedures to be followed by field public information officers. What it wants, for example, are good, well-presented stories about the soldier as an Army man. Some public information officers have a tendency to delve too deeply into the subject's civilian background, which is really unnecessary. If the local editor wants to color a home town release with background facts, he can get it from his files or by a telephone call to the soldier's relatives. Actually, home town newspaper readers are usually familiar with Joe Doe's pre-Army exploits. What they are interested in now is Doe's Army activities. If he is an infantryman, the story should describe him further as a rifleman, machine-gunner, company clerk or cook.

No longer is it necessary for field public information officers to list media on their releases to the Center. Not only has the Center a complete file of newspapers, radio and television stations in any given town in the United States, Puerto Rico and Alaska, but it has compiled data showing exactly what newspapers and stations cover a particular area. For instance, a story about a soldier from Elko, Nevada, would be dispatched to the *Elko Daily Free Press, The Progress,* Wells, Nevada (a weekly), *The Elko Independent* (a weekly), Radio Station KELY, and Radio Station KELK. The only media which need be specified are trade magazines, house organs, college or fraternal publications requested by the soldier himself.

The Center also has simplified the purely mechanical efforts of the field public information officers, freeing them for more creative work. Only one copy of any story or picture is needed,

In the mail room, sorting devices make certain that no editor receives more than one envelope on any given day. U. S. Army Photograph

regardless of the number of agencies involved. The Center does its own duplicating and reproduction of news stories, photographs and tape recordings—the number of each being determined by the automatic distribution lists on file. The average home town release is distributed to six outlets. Roughly the breakdown is: one daily newspaper, two weekly newspapers, one special media (such as a trade or college publication), and two radio stations.

Among its facilities, the Center utilizes a photo-engraving machine which produces one-column plastic engravings. Most small newspapers and many of the dailies utilize these and print directly from the plastic.

In the main, the Center exerts its control over the flow of incoming copy to insure uniformity of style, consistency of policy and a fair distribution to all media. No guesswork is allowed. If home towns are not clear or facts do not seem to support a story, the material is killed. If the story is important enough, however, the Center checks with the unit public information officer by the quickest means possible to get the facts clear.

Incoming copy is classified into two categories—flat and roster. The flat story is a better than usual home town story presented in such fashion that it stands on its own merits. It is preferred to all others, but it must arrive complete with nothing left to be done except minor revisions, copying and mailing.

The roster story is the type which applies to every individual in a platoon, company, battalion or graduating class. The basic

story remains the same. Slips indicating each man's home town, address, relatives and the like are attached to the basic story and mailed to the Center.

The roster story is the daily grist from the public information officers in the field. It may be a promotion, qualifications at arms, transfer or new duty assignment. Since it is the simplest to prepare, this type of report eliminates a considerable amount of work and affords the widest coverage for a unit in the field.

To date the Center has mailed out over two million home town stories. The staff of two officers, 51 enlisted men and 15 civilians turns out an average of eight thousand releases daily. In the order named, the following are types of stories which are given priority in handling: personal stories with a strong, timely news peg; awards and decorations; promotions; assignments of distinction; graduation from service schools; notable participation in a major field exercise; joining a unit in combat or overseas; top proficiency in weapons or equipment handling; and recognition as "soldier of the week" in a regiment or higher unit. Always the preference is for stories featuring the fighting Army either in combat or hard at work training for combat.

In submitting material to the Center, public information officers are urged to write in language which the layman understands, avoiding technical terms that are obscure to the average reader. Street addresses and towns must be given, no matter how small the town. This includes addresses of relatives. When parents live in one locality and a wife in another, the Center will move the story in both directions. When only one parent is listed, the Center wants to know whether one is deceased or whether they are separated, so that neither will be slighted, a serious matter in this kind of public relations.

It is not within the authority of the Center to issue casualty reports. Frequently, though, a local public information officer finds that a soldier on whom he submitted a story several days previously is now a casualty. In that case, he should notify the Center by the fastest means possible so that the story can either be withdrawn or timed to coincide with the official notification to the next of kin. Because of the ever-present possibility of a misunderstanding, public information officers are urged to date all their releases, making the time peg in the lead unmistakably clear. Editors are happy to co-operate in these matters, since they do not want to run misleading copy, and few if any parents object to a late story which indicates that their son was a good soldier doing a creditable job.

A commendatory story, however late, is far better than no word other than a casualty report. Such an article may give a family considerable solace and pride despite their bereavement. On the other hand, all relatives are upset and will object to an unchecked story getting into print which indicates a soldier is either alive or well after they have received an official notification to the contrary from The Adjutant General.

Already this experiment in highly centralized and supervised home town news coverage has been conspicuously successful. Not only is the Center in direct support of all field units it serves, but the units themselves are placed in direct support of Army-wide information projects. Since it is the desire of the Chief of Information to place emphasis on the role of the combat man, the Center can easily fulfill this requirement and at the same time offer unit public information officers a particular project upon which to peg part of their home town programs.

The vast majority of editors are highly satisfied with the service. In practice, the Center provides each of them with as much material as possible in one envelope, but not too frequently. The result is more economy and better relations with editors. Today more than 11,950 newspaper, radio and television editors, or about 85 percent of all daily and weekly media in the United States, are on the mailing list. With many editors actually appealing for the material, the Center has hundreds of complimentary letters on file, proving that the old days of the cold shoulder and the wastebasket have passed.

Gone, too, is the soldier's feeling that he has been forgotten at home. The apparent lack of interest which came close to public apathy was actually more a problem of troop morale than public relations. It is a little known fact that when a soldier's home town newspaper goes for weeks and months without some mention of him or his unit, he somehow feels that his community has let him down. He wants to be mentioned favorably once in a while, because no matter how faithful his platoon leader or company commander is in patting him on the back for a job well performed, the praise and the medals do not have the same effect unless friends, neighbors and relatives write him to say "We read about it in the paper."

As one regimental commander in Korea wrote, "I observed the miracle of increased combat effectiveness produced by publicity. As my men read about themselves they began to know they were hot and invincible. Their morale and pride actually rose in geometric proportion. . . ."

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